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HYPERTENSION AND ITS THERAPY*

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Hypertension is today's fancied-up synonym for *high blood pressure*. The latter term came into medical use in the early 1900's when the first attempts were made to utilize clinically the blood pressure measuring devices invented by the physiologists *circa* 1850. Hypertension is not a disease. even though some health authorities permit its inscription as a cause of death. It appears as a sign or symptom of disease,—but it is never anything more, clinically.

To interest you in the argument I am about to present, let me make some categoric statements:

1. What goes as, or with hypertension, now constitutes 60 per cent of all the things called the causes for death in man.

2. Hypertension is never consequent upon kidney disease (the so-called chronic interstitial nephritis of Richard Bright, today redubbed nephrosis).

3. The arterial compression instruments employed today to measure hypertension do not measure as much of an increased intravascular blood pressure as of a mere increase in the stiffness of the blood vessel walls at the place of measurement.

4. Hypertension thus comes to be a sign chiefly of blood vessel disease (commonly called arteriosclerosis, better called atherosclerosis, and best of all made synonym for the arterio-capillary-venous fibrosis of (Gull and Sutton).

WHAT MAY BE THE ORIGIN OF HYPERTENSION?

The high-priced books I carry on my shelves tell various stories: The Germans say that "arteriosclerosis is a constitutional disease"; the French, that "the arterial lesions in alcoholism may be taken as a type even though plumbism, gout, diabetes, old age, toxins, and the vegetable or mineral poisons may give rise to them." The British believe that "arteriosclerosis is the product of our high pressure life and too much alcohol, work and worry." With this the Americans agree, adding that "arteriosclerosis is the product of hypertension and/or results from a too rich protein diet." The volumes open and close with no defined statement of what might bring about vascular disease, thus leaving the practitioner to a therapy only ameliorative.

To put it flatly, no kind of systemic intoxication, however bad for the vascularly afflicted, has anything at all to do with its initiation. The recited elements (including "heredity") would bring down upon the victim a blood vessel breakdown *generalized* in character; actually it is always *local* in type.

To teach this fundamental principle of pathology I call the attention of my students to a cartoon in which a doctor is facing an old man with a bandaged right foot. "The pain in your foot is the consequence of your age," says the doctor; and the pa-

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tient answers: "Nonsense, my left is just as old and it does not hurt me."

Localized disease springs solely from localized cause,—inheritance, old age, alcoholism, and every other form of systematic intoxication cannot therefore be responsible. Had the old man's foot been tread upon, that could be the explanation; but in the absence of trauma, only one pathological mechanism remains to affect one side of a body and not its opposite; or one spot only in any uniform tissue and not the rest. This is the appeareance of a locally active insultant,—origin of which we know only as the product of microorganismal life sown into that part.

Vascular disease has never been produced experimentally through any kind of *general* intoxication; it succeeds only upon the distribution of proper microorganisms into the tissues of the host via the blood stream.

Hypertension has been debated as the *cause* of blood vessel disease, when as we shall see, it is invariably its *consequence.* To produce hypertension, Nerking and Steinbiss, in 1908, fed protein to herbivora. Their systemic blood pressures fairly doubled. Finding their animals on necropsy to evidence blood vessel changes, the authors reasoned that the latter were consequent upon the former. Van Leersum repeated these experiments in 1911, but even though he kept his rabbits in hypertensive state for months, he found them sound in their blood vessels. The former idea was long leaned upon as truth in the U. S. A. Really to understand what happened requires recollection of the fact that blood pressure always rises with increase in the daily protein ration. Western civilization steadily records a blood pressure fifteen points higher than that of the Orientals whom circumstance compels to live mostly on herbaceous food. Laboratory animals (like all the domesticated and the caged in our zoos) are notoriously badly fed (not because of wish but because of stupidity and lack of funds). Relative or absolute starvation is soundest ground for the implantation of infection, and it is the infection and not the hypertension that gives rise to the pathological consequences visible in blood vessel disease.

As Gull and Sutton said, the pathology of arterio-capillary-venous sclerosis starts in the capillaries; thereafter, if those constituting the vasa vasorum become involved, not only the arteries but the veins too are struck. Recall that the lesions of atherosclerosis are invariably discrete. Lay open an affected vessel (like an aorta) and observe that between the obviously sickened patches there appears an entirely normal blood vessel wall structure. Never is the whole of an intima, a media, or an adventitia affected. This would be the case if a "poison" dissolved in the blood were responsible; but even when the lesions of blood vessel disease go to the extreme of "pipe stem" arteries, they still remain spotty in character. The pathological process begins in capillaries which as it involves the capillary blood supply to the walls of both arteries and veins, leads to their destruction.

Anatomical change starts in (1) *embolism* with micro-organisms, consequent upon which is (2) an *anemia* of the part supplied. The situation is usually recovered from, but if not (3) anemic *infarction* follows, characterized by (4) *degeneration*, and when sufficiently severe, (5) *necrosis.* The process may be accompanied by (6) *hemorrhage*, (7) *absorption* and/or (8) *scar* formation(replacement by connective tissue either with or without calcification).

WHAT IS THE PATHOLOGY OF VASCULAR DISEASE?

The concept of blood vessel disease as the consequence of infectious embolism of the vasa vasorum may be said to have started with O. Huebner in 1874. Besides pointing to arteriosclerotic changes observable in the brains of his syphilitics, he indicated that the lesions (1) appeared in the nutrient vessels of the larger blood vessels, (2) that they became involved first in their middle coat and not in the intima or adventitia. Since his day the etiology of atherosclerosis stands divided between that due to syphilis (not more than 10 per cent)

and all the rest. This rest has been declared the product of senility, degeneration, and the other items cited,—everything, in other words, except the real agent which is metastatic infection by other kinds of micro-organisms. To be specific, the current type of hypertension with its complications, when not due to the spirochete, is due to a streptococcus (and or a staphylococcus or any other type of organism implantable in the vasa vasorum).

In 1912 Manouélin observed the lesions of blood vessel disease in 85 per cent of his rabbits after their intravenous injection with *killed* streptococci and staphylococci. Better evidence of the infectious and embolic origin of vascular disease has come since. Besides joint, muscular, and nervous lesions, Hartzell and Henrici described the appearance of vascular plaques in rabbits injected with the scrapings from infected teeth. Benson observed atherosclerotic lesions in the aortae of rabbits after their injection with the *streptococcus viridans* recovered from a human instance of coronary disease. E. R. Le Count and Leila Jackson saw the picture of chronic interstitial nephritis repeated in animals through the intravenous injection of streptococci. George Dick generalized on the problem when he discovered that the strains of organisms recovered from human instances of nephritis localized in the kidneys of experimental animals upon intravenous injection. We owe to N. W. Jones the finding of micro-organisms in thickened coronaries and the experimental consequence of the implantation of these organisms into the teeth of dogs. They lived miserably for years, to die in the end of vascular disease and its complications.

HOW DIAGNOSE BLOOD VESSEL DISEASE?

It rests upon two items: (1) sclerosis apparent in arteries and/or veins; (2) systemic blood pressure increase. Many other items are recited as diagnostic of the clinical situation but they should be seen for what they are,—pathological *consequences* of vascular diseases. (Here it should be noted that a "normal" blood pressure in man is not 100 plus the age of the patient but, in adult life, always something within a few points of 125 over 85. A man of fifty with a systolic blood pressure of 150 requires recheck).

Hypertension (except as seen in the muscularly active, and therefore, the young) has origin in only one of three possible springs. Dismiss a paralysis of the carotid sinus as clinically improbable. This leaves two. In the resting patient, increase in systemic blood pressure appears only (1) when the intracranial pressure is increased; (2) when the blood vessel bed is diseased. The latter is what is under discussion.

The increased blood pressure observable in vascular disease is not due to roughening of the blood vessel walls (the internal friction of a liquid depends upon itself, not upon the character of the tube which it wets and through which it passes). More primary is a decrease in caliber of the blood vessels due either to (1) scarring, (2) spasm. This narrowing requires that the heart work harder to keep up adequate circulation and explains why the heart hypertrophies.

Of greatest importance next is to see that the compression methods used clinically do not so much measure this dynamic source of rise in blood pressure but more definitely its static—*the increase in the stiffness of the blood vessel walls.* As Clyde Brooks demonstrated *circa* 1915, hypertensives may show *no* increase in intravascular blood pressure at all when measured *directly*, (as by puncture of an artery with a hollow needle connected with a manometer). The more commonly employed clinical devices do not, therefore, measure increased intravascular pressure as much as they measure the resistance to compression of the walls of the blood vessels. It is on such account only that the blood pressure on one side of the body is read off as greater than that of the opposite; the intravascular pressure is the same in both but not the stiffness of the tubes carrying the blood.

It is only through the maintenance of a

normal or a heightened intravascular blood pressure that the vascularly diseased keeps alive. When in unaided circumstances (as though the progress of his disease) it *falls*, the patient does not improve but grows worse. He becomes a "heart case" and dies of decompensation. Digitalis and strophanthus, help him but not because they *lower* his blood pressure but because through action on a failing heart, they *increase* it! Cardiac hypertrophy is not a constant in vascular disease; even as it is present in all laborers, trainees, and leaking heart valves. This is a roundabout way of saying that all the alleged signs of vascular disease besides the obvious changes in the blood vessels and the hypertension are really only its consequences.

WHAT INVALIDS THE HYPERTENSIVE?

The picture is that of a rotting tree, withering unequally in its branches. The "old" man is the commonest picture of the still ambulatory victim of chronic and progressive vascular disease. He dodders not only motorially but mentally, has albumin in his urine, complains of failing eyesight, cannot make the hill any more, and goes to sleep over his newspaper. Infarction has cut one spot after another out of his (1) brain, his (2) eye, his (3) kidney. Because of item (2) he is declared the victim of an "albuminuric retinitis" unless the whole of the eyeball is deprived of circulation, when the diagnosis becomes glaucoma. Small and recurring infarctions of item (3) underlie Bright's disease (the primarily sclerosed kidney with its few casts, little albumin, and normal water output, because plenty of kidney substance is left for efficient kidney physiology). When vascular disease involves the nutrient streams into the walls of the larger blood vessels a more major insult to the blood supply of a whole member may come about: the (4) "gangrenes" of toes, feet, and legs. Multiple small infarctions thus affect the (5) heart. The product may be an "atrophy" of the heart muscle mass ("brown atrophy," and identical pathologically with chronic interstitial nephritis or a shrinking brain and spinal cord) or mark the origin of an angina. This is a state of pain induced through lack of oxygen and the resultant "cramping" of the heart. Maintained contraction in any muscle mass, including the involuntaries, is accompanied by pain. This mechanism underlies (6) intermittent claudication. Well to see finally, that the progressive "degeneration" described above may affect the physiology of any other tissue or organ not already mentioned. Degeneration of the islands of Langerhans in the pancreas consequent upon blood vessel disease and a resultant (7) diabetes mellitus is perhaps the most striking example.

WHAT KILLS THE HYPERTENSIVE?

A third of them die of intercurrent disease or accident. The remainder perish in equal number by (1) the heart route, (2) the head route. Primary death due to kidney failure scarcely exists. (The oliguric albuminurias observed in the terminal hours of the hypertensive, are due to cardiac failure, and the superimposition of the generalized nephritis caused hereby, upon the more disseminated spots of insult which appeared earlier in consequence of the capillary occlusions characteristic of the initiation of blood vessel disease of grosser form.) Exitus through circulatory breakdown should be seen for what it is,—the product of repeated and weakening infarctions of the heart muscle mass. When small, they require years ordinarily before decompensation comes into view but only seconds when coarser insult is given by larger scaled occlusions, as in coronary disease. Death in coma is usually laid to uremic poisoning. This it never is, for complete destruction of all kidney function is never followed by stupor, coma, and convulsions, alleged in the clinic to be the signs of "uremia." Then what are they? Uremia at bedside designation is an anemia and an edema of the brain induced in the vascular case through a gradual or more sudden interference with the through-flow of blood.

HOW TREAT BLOOD VESSEL DISEASE?

The matter divides, naturally, into measures palliative and those curative. Under

the former head, the aim is to (1) stop constricting action; (2) favor the vasodilative. Both nature and the drugs can be drawn upon for help. Vascular stiffness due to scarring and the deposition of calcium salts is usually dismissed as beyond therapeutic help. But whatever remains of tonus in the musculature of the arteries and veins is not. Worry, everywhere expressing itself in increase of muscular tone, involves the blood vessels too. But it is silly to think that the intelligent, who alone worry, will cease firing on mere command. Increase in body acid increases vascular tone —which explains why hard work and cold are not to be recommended. Coffee, adrenalin, digitalis, and strophanthus behave similarly. But their proscription calls for common sense. The increase in cardiac efficiency brought about by digitalis, for example, needs to be balanced against its vasoconstrictor effects.

To favor vasodilatation physiologically requires that the human organism live quietly in warm, fresh air. Thus far God has always been better at its provision than the ventilating engineers. In desperate moments (as in angina pectoris or intermittent claudication) the nitrites, and nitroglycerin help. Their quick action is not long lasting; wherefore, I suggest the addition of tincture of lobelia to prolong relief.

Bleeding sometimes helps, especially the circulatorily "embarrassed." It should not be practiced in the obviously anemic. Other things the same, blood pressure is the product of a relation—the quantity of the blood against the capacity of the blood tree. Either too much blood or too little space yields hypertension. Wherefore the loss of a pint of blood or two even, by the otherwise physically fit, may be followed by an agreeable (and fairly lasting) sense of relief.

But none of these things "cure." This is because they do not touch first cause. This lies in disease of the vascular tree, the product of repeated embolic infections infarcting the coats (the media chiefly) of the larger blood vessels.

Not more than 10 per cent of the hypertensives are syphilitic. The rest are infected by other microorganisms; they are not the subjects of heredity, emotional instability, worry, whiskey or hard work. Substitute the name of any pathologically effective organism for that of syphilis and a clear concept is obtained of all that is and all that complicates "hypertension."

The streptococcus is the favorite. And where might it be coming from? Both it (to produce the peripheral degenerations) and its toxins (to produce the generalized tonal increase) derive from first foci of infection. In 99 per cent of the clinical instances they lie in the teeth. Hypertension appears in children when the tonsils must be looked to, but as generally viewed, it is a disease of adults, and of such, beginning after forty-five. The moment corresponds with the time at which the subjects (usually tonsillectomized in childhood) no longer "resist" the infection in and about their teeth started mayhap in their teens. The noxious organism breaks into the general circulation and is swept by it into the peripheral tissues and deposited there. When these are the walls of the blood tubes, vascular disease is the outcome and it is its manifestations in the particular organ involved that draws the clinical picture. To reduce hypertension and to arrest progress in vascular disease, if not more can be accomplished, require therefore attention to the teeth of the hypertensive.

Proper judgment must be passed upon what appears in a mouth. Inclination is to refer diagnosis to the dental colleagues. It is better to do the job yourself. But do not go in immediately for x-rays, for your eyes and fingers are better tools. Carious, discolored, heavily filled, crowned, pegged, eroded, hypersensitive or hyposensitive, dead and pyorrheic or sclerosed teeth are all suspect. Use x-rays to substantiate your physical findings and to expose lesion hidden from the naked eye.

What happens to teeth is covered in the names of two pathologic processes—osteitis and/or arthritis (gingivitis). The situation commands that all efforts at surgical

attack upon the teeth and/or their housings be guided by the laws of the orthopedist. The dental surgeons but rarely accept this generalization. It compels our profession to reassume its obligations as "physicians and surgeons." The doctor of medicine, in other words, must take up a job which the dental surgeon will not. Little can be done medically for chronic foci of infection whether implanted in the teeth or elsewhere. They require surgical eradication, which means not only the removal of offending teeth but of the areas of infection found in the alveolar processes surrounding them. The latter belong to the teeth, rise with them, and are absorbed physiologically when they fall. The surgeon who amputates them at the time of an extraction aids nature.

The story has a happing ending. Properly executed, dental surgery removes almost at once a source of constitutional poisoning responsible for the too high "tone" of the blood vessels of the hypertensive. But do not tell the patient that you expect more—even though you will get it. The level to which hypertension can fall depends upon two factors: the reversible of muscle spasm and the not-so-reversible of organic change (fibrosis, calcification). Proper mouth surgery usually yields not only arrest of progress in disease but within limits, appreciable restoration.

CLOSE

I have talked to you as general men in medicine, of the commonest of man's diseases. The hypertensive with vascular breakdown requires for his care the intelligence of a doctor and not that of many specialists, for his illness is not that of days but of decades. Sir James Mackenzie left country practice for the floors of a city hospital, only to return to the country,— to observe and to treat better the beginnings of those diseases which in the end kill.

DISCUSSION

1. Question: What is the familial hypertension theory?

Answer: The belief that it is an inherited form of disease, and that nothing can be done about it. The same argument is applied to diabetes, insanity, blood, heart and kidney disease, and a dozen more. It is easier to understand the state of these patients on the basis of infection than of fimilial type. No one is surprised to find two or three children out of five or six in a family affected with scarlet fever or poliomyelitis, yet when the infection is of more chronic type, the blue sky is called upon for explanation. As often as not, grandmother's kiss starts the babe into the disasters of its own old age.

2. Question: How long does it take an emotional spasm or constriction of blood vessels to become fixed to produce hypertension irreversible?

Answer: Spasm of the blood vessels is a vasomotor reaction initiated in the upper portion of the spinal cord and the basal nuclei. Their connection with the cerebral cortex allows the "mind" to have an effect on the general blood pressure. The hypertension resulting therefrom never becomes fixed. The fixed types of hypertension are due to fixed stiffenings of the walls of the blood vessel due to scarring and calcium deposition.

3. Question: How about sodium chloride restriction therapy?

Answer: No matter where practiced or on what disease, it is wrong in principle and hurtful to the subject. It was initiated by Fernand Widal in the early 1900's for the reduction of edema. Within the last decade or two it has found employment for the reduction of high blood pressure. This it does; by half killing the patient. Sodium chloride restriction destroys the appetite and the patient, therefore, sinks into the class of the protein-starved. This is what the Europeans have been getting for nothing and is identical with what is war-edema. As stated a moment ago, the higher pressure of the occidentals, as opposed to that of the orientals, is due to the fact that the former get more meat, fish, eggs and cheese than the latter. Protein in the diet increases the blood pressure which, because short in the Far East, compels its people to drink tea, coffee, and cacao (the methyl purines of which are identical with those furnished in the digestion of protein). Since we get all the meat and fish we want, we get along on fewer cups of coffee a day. The consumption of tea and coffee goes up as the meat ration drops. It is the drug way of making us feel better. When there is added to the element of sodium chloride restriction, that of the rice (carbohydrate) diet, things go down hill fastest of all. Of course, the blood pressure of the victim sinks. But nothing in the pathology of the patient is altered except for the worse. Put him back on sodium chloride and a square meal and in three days his blood pressure is back where it was before this therapy was started.

CHOICE OF THERAPEUTIC AGENTS FOR ANEMIA

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NEW ORLEANS

Management of the patient with anemia is a very common problem for every practicing physician, whether in general practice or one of the specialties. This problem is complicated rather than simplified by the continuous bombardment of advertisements for antianemic preparations, letters which are confusing because in general they are filled with half-truths and incomplete summaries of reliable medical articles, cleverly interwoven to seem to support completely unjustified conclusions. In the face of this it is difficult for us to retain proper perspective of the problem of the anemic patient and realize that his management should be quite easy. For if any one can answer a few simple questions about the anemia, the proper treatment is usually obvious. The basis for the decision is not complicated; it consists of a history and physical examination, a complete blood count, a hematocrit, and occasionally a serum bilirubin, reticulocyte count, gastric analysis, or other laboratory study. With this information one can usually answer the key questions: "Is this patient anemic?", "Is this an acute or chronic anemia?", "What is the average cell size (or volume index)?", and "Are the cells deficient in hemoglobin (i.e., is the hemoglobin concentration or saturation index low)?".

Once these questions have been answered, one is well on the way to deciding first, the probable cause of the anemia, and second, what type of treatment is likely to be effective.

The first question, "Is the patient really anemic?", may seem out of place, yet the failure to answer that correctly is perhaps the greatest single pitfall in the treatment of anemia. Certainly the existence of an anemia is such an important point to establish in diagnosis that anyone suspected of this should be entitled to a hemoglobin determination, red cell count, and hematocrit determination. And in the interpretation of these results, one must realize that these values are normally lower in children than in adults, lower in women than in men, lower in pregnant than in nonpregnant women, and that even within these groups there is a wide variation from average which may still be perfectly normal for that patient. Time does not permit further discussion of this point, except to emphasize that anyone treating anemias should have ready access to a chart of the range of these normal values, such as can be found in any good hematology textbook.

The next question, "Is this anemia acute or chronic?", must be answered chiefly from the history and physical examination. The conclusion can often be confirmed by the laboratory determinations, for it takes several weeks or months for a true macrocytic anemia or hypochromic anemia to develop. Normocytic normochromic anemias may be either acute or chronic. If the anemia is acute, it is almost certainly due to either blood loss or excessive blood destruction. If due to acute hemorrhage, the only important therapy for the anemia is the judicious use of transfusions while the cause of bleeding is being found and corrected; later, iron should be given to replace that lost in the hemorrhage. If the anemia is hemolytic, the problem is also one of supportive transfusions, if necessary, while the cause of the hemolysis is being identified and corrected. Even so, unless the patient is critically ill, transfusion usually is not necessary and should be deferred if possible so that the anemia may be studied more satisfactorily.

The next two questions may be considered together, for both are based on laboratory determinations. From the hematocrit value and red cell count one can calculate the mean corpuscular volume. From the hematocrit and hemoglobin values one derives the mean corpuscular hemoglobin concentration. Volume index and satura-

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tion index, respectively, may also be used to express these values. Those anemias which are macrocytic belong, with a very few exceptions, in one group; those that are definitely hypochromic, and usually also microcytic, in another; the rest, almost all of which are normocytic and normochromic, may be placed in a third group, although this latter is indeed a heterogeneous assortment. Let us now consider these groups individually.

In the early days of liver therapy, Castle showed that a substance in the diet, extrinsic factor, and a substance in normal gastric juice, intrinsic factor, were acted upon by the liver to form a third substance, erythrocyte maturation factor, which was essential to red cell maturation in the marrow. When this EMF was deficient for any reason, the red cells failed to mature, and instead of normal marrow, one saw many very immature nucleated erythrocytes. Further, those that escaped into the circulation were abnormal in size and shape, with the average size much larger than in normal blood. These changes occur regardless of the cause of the deficiency of EMF. Supplying the erythrocyte maturation factor, EMF brings about a dramatic improvement in the clinical picture within a few days, and a prompt maturation of the nucleated red cells of the marrow with a marked rise of reticulocytes in the blood stream in five to ten days after therapy is started. If the deficiency is the result of inadequate extrinsic factor in the diet, the only satisfactory treatment is a balanced diet; this may have to be supplemented at first. In the others, supplying the missing EMF is the treatment of choice, and the best source of this is liver extract. The dosage recommended is at least one antipernicious anemia unit per day, which can be administered as crude liver extract, purified liver extract, or as oral liver concentrate, provided one gives adequate amounts of a preparation assayed for antipernicious anemia principle. The agent of choice is purified liver extract, for it requires a smaller volume per injection, is less painful, produces fewer reactions, is the least expensive per unit, and is fully as effective as crude liver. Most patients find oral liver more disagreeable than parenteral extracts.

Two other therapeutic agents have recently been tried in macrocytic anemias. The first of these, pteroyl glutamic acid, or folic acid, produces very satisfactory hematologic response but, in patients with pernicious anemia, frequently allows severe neurological lesions to develop and progress. Except for the unusual megaloblastic anemia of infancy it probably has no advantage over liver extract. In a practice limited to hematologic problems I have found no need for this preparation since it became available commercially, or any patient in whom its use improved the results obtained from purified liver extract. Its mode of action remains a mystery; it is neither intrinsic factor, extrinsic factor, nor erythrocyte maturation factor.

The second newcomer, vitamin B_{12}, is too new to be completely evaluated. It is a compound containing cobalt, effective in doses of about one millionth of a gram per day, and very comparable to EMF in many ways. Castle has recently amended his original conclusions to postulate that vitamin B_{12} is probably both extrinsic factor and EMF, and that intrinsic factor is probably an enzyme which promotes absorption of vitamin B_{12} from the gastrointestinal tract. If this is correct, vitamin B_{12} may eventually replace liver extract entirely in the treatment of macrocytic anemias. It does not seem to lead to increased neurologic damage, as folic acid does. Allergic reaction to vitamin B_{12} does not seem to develop, as it occasionally does to the impurities of liver extract. However, experience with this substance is still quite limited, and until it has had much wider and longer use, I believe the agent of choice in the treatment of macrocytic anemias should be purified liver extract. The comparative daily cost of treatment of a patient with pernicious anemia with these various preparations, as taken from representative retail price lists, shows that at present purified liver extract is still the least expensive.

The second group, the hypochromic anemias, have as a common denominator a defect in iron metabolism. Iron is absorbed from the intestinal tract as a ferrous salt, forms a loose combination with protein, and is carried in the plasma to the reticuloendothelial system where it is stored, chiefly in the liver, spleen, and marrow, or promptly synthesized into hemoglobin by the marrow. An important but small and apparently rather stable fraction is incorporated into tissue enzymes. When red blood cells break down the iron from the hemoglobin is removed and either reutilized or stored; contrary to older ideas there is no mechanism for the excretion of significant amounts of iron, and once in the body, iron remains there until lost by hemorrhage or pregnancy. Therefore, the only need for iron is for additional hemoglobin during periods of growth, for replacing the iron transferred from the mother to the fetus, and for replacing iron in hemoglobin lost through hemorrhage. The importance of this concept cannot be overemphasized, for in the absence of rapid growth, pregnancy or hemorrhage, the need for iron in the diet is nil, and iron deficiency occurs only as a result of one of them. In addition to actual iron deficiency, there are only two other significant causes of hypochromic anemia, namely, chronic infection or heredity. In the presence of infection there is interference with the ability of the body to utilize iron, and in chronic infections this may eventually result in hypochromic anemia. However, there is no lack of iron in the body, the iron stores are still available, and so long as the infection continues no amount of iron therapy will improve the anemia, so that there is no justification for attempts to treat this anemia with iron. The familial type of hypochromic microcytic anemia has been recognized for over two decades as Cooley's anemia, but, only in the last decade has it been commonly realized that a milder form of this disorder, usually known as thalassemia minor or Mediterranean disease, exists in adults, ordinarily without symptoms. The nature of the hereditary defect is not understood, and no treatment is of value. The importance of establishing the diagnosis is to explain the nature of the disorder and its hereditary character to the patient, and avoid the common error of attributing his symptoms to his anemia and focusing his attention on it by months or, more often, years of ineffective, unnecessary and expensive treatment.

If a patient really needs iron, how much and what compound is best? The best preparation is a simple, readily soluble ferrous salt, and the two most commonly used are probably ferrous sulfate and ferrous gluconate. Ferrous sulfate is less expensive, and in proper dosage is usually well tolerated; however, those patients in whom gastrointestinal disturbances develop from ferrous sulfate usually are able to tolerate the gluconate satisfactorily. The usual maximum daily increase in hemoglobin is less than 2 per cent, which requires less than 100 mg. of new iron. Three 0.32 gm. (5 gr.) tablets of either the sulfate or gluconate contain well above this amount, so that one such tablet after each meal is ordinarily an optimum amount. Larger doses may be tried if the response is unsatisfactory, but too often the larger doses produce constipation, anorexia, nausea, and occasionally vomiting, and the patient discontinues treatment entirely. The immediate clinical response to iron therapy in patients who actually need it is a little less impressive than liver therapy in macrocytic anemias; however, the reticulocytosis and the rise in hemoglobin is comparable, and one may anticipate a completely normal blood count within four to six weeks. Failure to achieve and maintain this should be cause for careful search for the complicating factors. Parenteral iron therapy is seldom necessary; when it is, transfusion is probably the best form. A British preparation, saccharated oxide of iron, is very effective, well tolerated, but not yet available here.

The market is flooded with iron preparations combined with liver, folic acid, vitamins, bile salts, thyroid, and copper. What advantages do these have? None. If the patient actually needs iron, then iron alone is adequate. If there is a complicating dis-

order, it should receive treatment on its own merits. In therapeutic doses iron is absorbed satisfactorily even in the complete absence of hydrochloric acid, and clinical experience as well as experimental evidence amply confirms the fact that none of these so-called adjuvants need be given for completely satisfactory treatment of the iron deficiency. Furthermore the use of such "shotgun" preparations too often ruins the opportunity to confirm the diagnosis by observing the response to the one factor which is needed. Finally, the cost is often multiplied manyfold.

The two most common anemias have been saved till last. The first of these, and the most common true anemia, is the simple normocytic normochromic anemia seen in patients with systemic disorders ranging from mild endocrine dysfunction to severe infections and malignancies. This anemia is not understood but appears to be the result of deranged metabolic processes in the patient. There is no effective treatment at present for this type of anemia, save correction of the primary disorder; if this can be done, the anemia disappears spontaneously and often surprisingly rapidly. Transfusions are of temporary value as a preoperative measure, but otherwise their benefit is fleeting and their expense and inconvenience seldom justifiable. The second and even more common is the patient, usually a woman, with neurasthenic symptoms whose hemoglobin is so often in the normal range but slightly below average, and who therefore has a diagnosis of anemia made and intensive therapy, usually parenteral liver or a "shotgun" preparation, started. The original diagnosis of anemia is usually based on either laboratory error in single blood count or failure of the physician to recognize that hemoglobin values of 11 gm. (or 70 per cent) or even less may be, and often are, normal values for that patient. The increasing cognizance on the part of the public of functional disturbances makes it even more important to explain the problem to the patient rather than focus her attention on one facet of it, thereby strengthening her suspicion of organic disease and making the eventual proper management of her problem more difficult. Suffice it to say that no antianemic preparation has any effect on the hemoglobin level of this group of patients, beyond the normal variation from one blood count to the next.

In summary, the choice of a therapeutic agent in anemias depends upon establishing the presence of the anemia, its type, and its etiology. Judicious transfusion of whole blood may be a necessary supportive measure in a very ill patient while studies are made pending definite therapy. If the anemia is a true macrocytic anemia, the choice of therapeutic agents is still concentrated liver extract, with a few exceptions, although vitamin B_{12} may eventually prove a satisfactory substitute. If the anemia is due to iron deficiency, the only agent necessary is a simple ferrous salt. The use of complex hematopoietic agents is unnecessary and merely increases the expense and confusion.

PSYCHOBIOLOGIC PSYCHIATRY*

HERBERT E. HARMS, M. D.**

NEW ORLEANS

It is indeed gratifying to me that our Society requested a discussion tonight within the realm of psychiatry. If you believe there will be great differences of opinion between the schools of medical psychology to be discussed, then you probably will be disappointed. There is little question that there have been divergent theories in the past, and undoubtedly new ones will appear, but clinically we are all interested in attempting to make the individual a more comfortable person within himself for psychiatry is still largely a clinical subject. It is true that there is a difference of emphasis in the various systems of medical psychology. Psychiatry is still in the

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stage in which far greater demands are being placed upon it than trained personnel can meet. The recent developments in psychiatry have been rapid. Its rise to prominence has a kind of Cinderella motif. It has been, until recently, the stepchild of medicine, especially so when it was isolated in the far away state hospitals. Under the stimulation of two world wars, especially the latter one, when crushing demands were made for help, it assumed a new status, and I might add, something of a new name, "psychosomatic medicine," which has suddenly seemed quite acceptable to even the most presuming organicist, who now finds himself fired with enthusiasm to know more about this stepchild suddenly grown big. He has a great desire to gain information regarding the essence of psychiatry which will be useful in his daily practice.

It has been realized by many new enthusiasts in the medical field that application of a certain theory, hurriedly read and poorly digested, cannot be the common denominator for all their office consultation problems. Research in psychiatry has been great, but it has not as yet discovered a one way out for mankind's emotional dilemmas. For any school of thought to set itself up as a panacea, or purport to have the one finite answer is, in our present state of knowledge, wishful thinking. Those who have attempted to apply a hastily learned psychiatric principle have been quickly disillusioned by its inefficacy when applied to a variety of cases.

It has always been the desire of psychobiologic thinking not to be guilty of isolationism in dealing with the dynamics of behavior, but rather to be interested broadly in multiple causation which can be handled therapeutically on an individualized basis. Thus, the principles of all disciplines within the field are utilized whenever possible in any given case.

I would suppose that the request made to contrast the formal analytic approach in treatment to the psychobiologic one indicates that these two approaches have been considered different by those educated in the New Orleans centers of medicine. Actually, of course, there have been a whole series of schools, each of which has contributed something to the understanding of personality. Behavioristic experiments with infants in this country were based largely upon Pavlov's work and preceded the establishment of the Pavlovian laboratory of Horsely Gantt; Alfred Adler's teaching that personality difficulties have their roots in feelings of inferiority and insecurity, is still a concept used by many. Certainly, it has had a great influence in the field of education, as for example, the stressing of sports in the American educational system. You are all acquainted with the extroversion-introversion hypothesis of Carl G. Jung, which was so popularly discussed some years ago. There are the attitudinal theories of Alport and Vernon, who point out that by the time a child is old enough to wield a pencil or perhaps even walk he has built up a group of attitudes toward other persons, objects, space, and himself, all of which demonstrably influence his personality. There are other contributions including the widely used psychologic tests, which too have aided in understanding the behavior of people more thoroughly.

It is most important that Freud's recognition of dynamic principles in the field of hysteria was a brave and fruitful departure from all previous tradition at a time when stagnation was threatening psychiatry. At the same time his frank approach to the problems of sex, shunned with the most unreasonable prudishness, undoubtedly paved the way to such publications as the Kinsey Report, which would have been locked away from the reading public twenty years ago. The concept of conscious versus unconscious has proved practical even though there continues to be didactic debate as to what we understand by conscious activity. It was Adolf Meyer who said, "Man has his consciousness for his own convenience rather than for mere communication," and it was Nietzche who remarked, "My memory says that I did it, my pride says that I could not have done it

and in the end, my memory yields." These simple statements seem to me to render the awesome concept of consciousness rather easy to understand. Adolf Meyer[1], coiner of the term psychobiology, succinctly expressed his views on the subject when he wrote, "In the simple and direct words of the man in the street, objective psychobiology occupies itself with performances, actions, reactions, and attitudes, thoughts and expressions of a person or group, of sufficient importance to call for attention for the role it plays in the person's life, and to deserve being scrutinized for the conditions of its occurrence, the factors that enter, their working and their effects and results, and the range of their modifiability. And within this setting it is the task of the observer to know how far he has to go into the distributive analysis to be in command of the facts for the understanding and management of the person."

Psychobiology has always striven to be both eclectic and pragmatic. I recall that in 1936, when prefrontal lobotomies were first done in this country, Meyer assisted those with the courage to begin this work. He was not averse, finally and after considerable deliberation, to use the various shock therapies and to aid their development directly. He was interested in what the orthodox analyst would contribute to the knowledge of personality development. He has often said, "Let us use that which works."

What one considers psychoanalysis, is today, changing. There is that concept which is based on conformity to the requirements of daily interviews, uninterrupted free association, and the use of a couch, and which expects the inevitability of the transference neurosis. All modern psychiatric practice is in a broad sense analytic, for it is the aim of all of us to use available psychodynamic principles. It is further, it seems to me, important to shorten, so far as is possible for purposes of economy, the duration of treatment. To this end we are indebted to the investigations of the painstaking analyses carried out in the past, and in the words of Gregg, we should capitalize on these research gains by applying again those "things which work." This has always been a psychobiologic aim; it has also been its purpose to carry to the profession at large the lesson that all are potential psychotherapists if they will but listen and have interest in learning. Further, it has been its principle to give direction to a patient rather than to allow him to go on in his process of viewing himself with such autistic scrutiny as to lose perspective of his responsibility.

We are all indebted to Freud and his coworkers for the concept of time in treatment. A few years ago, emphasis was laid upon some special event which, if ferreted out, would relieve the problem through intellectualization. In this direction, I am constantly reminded of the impatience of referring physicians when a specific dynamic formulation has not been attained soon enough; they erroneously believe that such intellectualization would put an end to the problem at hand.

Patients are today prepared to expend time and effort toward a better understanding of themselves through a series of interviews rather than from one consultation in which the physician is expected to supply a simple formula for good mental health.

The goal of the patient and physician in a joint therapeutic venture is directed toward synthesis of the various factors which will offer security. Treatment is guided by the need of achieving a more wholesome integration of the personality. I have often said that if physicians recorded their advice to patients, they would have many embarrassing surprises if they later listened to these recordings. All statements to patients should be brief and easy to comprehend. Evaluation of a patient's problems should not be carried out along lines of rigid situations and reactions thereto, but rather the finely shaded as well as the intense emotions should be weighed for their influence upon the person.

Every interview must be ultimately constructive and must support the self. Patients, in scrutinizing themselves, often become aware of their shortcomings and fail-

ures. Care must be taken not to allow them to dwell on their sense of failure in order to avoid a complete breakdown of an already sagging personality. One should expect the patient to retrace his steps in therapy to know what he has said, why he said it, and what significance it has been to him. All too often patients leave with only poor comprehension of the psychotherapeutic efforts of their psychiatrist.

We speak in psychobiology of distributive analysis and synthesis, and this is adjusted to the patient's needs and type of illness. Psychobiology does not exclude other therapies, whether they be physiologic or otherwise, but believes they should go hand in hand if need be. In this sense it strives for a more total approach. It can, on the other hand, confine itself to the psychologic illness itself, making free use of free association, dreams, symptomatic acting out of emotions, reactions of hostility, and the many other meaningful inner psychologic processes.

We have made free use of those wartime developments of narcosynthesis to shorten the duration of treatment, and of insulin as a physiologic means of reducing tension. It is the purpose of medicine to seek out the shortest route to health. It is my belief that a pluralistic approach is frequently sufficient to achieve good personality function on a plane commensurate with the natural assets the person possesses.

REFERENCE

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TREATMENT OF PSYCHOSOMATIC DISORDERS IN THE MALE PATIENT*

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NEW ORLEANS

Uncertainty and anxiety plague many patients who consult us today. Although less demonstrative than his mate, the male of our species is by no means immune from psychological problems. A rapidly growing, complex social structure deprives him of the important place he once occupied in his home. Occupational pressures make the development of avocational pursuits all but impossible. Neurotic shackles often so bind his wife that lack of sex expression becomes another difficulty which besets him.

Not only is his present situation difficult but insecurity both emotional and environmental characterized his early years. A considerable proportion of his adult life was spent in a war torn world. He saw his life regimented during several years of military service and observed emotional problems develop all around him. Economic and political insecurity confront his future years. For the first time in his earthly history man is preoccupied with the possibility of complete atomic destruction in the not too distant future. Truly a remarkable and tragic picture confronts us when we consider what man has made of man and what he has brought upon himself.

As physicians, we are interested in man's frustrations and in his attempts at solution. He may show aggressive outbursts and become an antisocial creature in constant difficulty with his environment or he may find life's entire process too confusing and withdraw into the unreality of a psychosis. Most frequently, however, he compromises; he sickens and resumes a dependent infantile status wherein illness offers an escape from a dilemma which seems impossible. The study of man, his sickness, his escapes, his environment, and his background constitutes another approach to his problems which we have come to call psychosomatic medicine.

Psychosomatic medicine is neither a new discipline nor a new specialty. For generations it was understood that emotional processes played a role in the genesis and course of certain disease processes. Many of us have heard our colleagues remark that Mr. Smith's blood pressure was rising and that he had better be given some sedation until the impending business deal was past. Or perhaps the physician expressed concern over Mrs. Smith's recent migraine attack

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and decided that Smith needed a hint that too much attention to the office routine and not enough to Mrs. Smith is a fault that needs correction. While it is true that often such an approach was practiced by the physician not at all acquainted with the discipline we are here discussing, nonetheless, he was practicing a form of psychosomatic therapy, a new term perhaps, but an art as old as medicine itself. We shall simply attempt now to briefly organize some of the concepts and ideas which explain the efficacy of an approach which considers the individual and not solely his disease.

It is unfortunate but true that dealing with the patient instead of with his disease is for many physicians a lost art. During the twentieth century medical science along with other trends in our daily lives has become more and more mechanistic. Increasing concern with blood chemistries, electrocardiagrams, x-ray films, to say nothing of exploratory laparatomies, allows little time for us to consider the patient with his ancestors, his early life, his sexual adjustment, his vocational status, his drives, anxieties, fears, fantasies, hobbies, or bank account. Until we have some awareness of the patient's content of thought, until we know the patient as a personality instead of just another stomach or heart, our therapeutic abilities will be extremely handicapped.

An important concept in psychosomatic processes lies in the belief that emotional processes influence and at times precede tissue change. For example, most of us will accept the idea that in persons with a labile blood pressure, chronic anxiety and apprehension may influence blood pressure elevation and thus be an important factor in the chain of events which finally produces the terminal picture of hypertensive heart disease. A similar case can be made out for the patient with migraine, peptic ulcer, ulcerative colitis, and certain skin disorders, chiefly the atopic dermatoses. Let us briefly consider some of the thinking and behavior habits of modern man that we feel play an important part in leading him to his own destruction.

One feature that makes life unpleasant and at times intolerable is anxiety. Difficult to define but because it is so universally present, a definition is not too essential. Variously described as a feeling of impending disaster, a feeling of morbid apprehension, and the like, it is accompanied by a series of physiological occurrences with which all of us are familiar. Perhaps its origin lies in the individual's remote past; perhaps it lies in an early sex trauma, perhaps it was recently reactivated by a trying life situation. Regardless of its origin or severity, it must be understood by all of us that it is a common feature in practically every patient who consults his doctor. Our success or failure in large measure depends upon our ability as therapists to handle the patient's anxiety.

Modern man finds himself in a peculiar situation. Being primarily the more aggressive of the two sexes, he is surrounded by women who often are trying to outdo him in the expression of their aggression. During the past half century we have seen woman achieve her long sought emancipation. Far from being dependent upon her mate, she now finds herself competing with him at every turn. This brings us to a common emotion which is of considerable importance in the topic we are discussing, namely man's hostility. Those of us who spent anytime as doctors in the military service and inquired into the lives of the American soldiers obtained some idea of the origin of this feeling. Reared often by a mother who was unable to look to a husband for the satisfaction of her dependency feelings, she looked to her young son for the emotional satisfaction thus denied her. All too often she made every effort to keep the tie between her son and the umbilical apron strings a permanent one. This attempt often leads to the boy's first expression of hostility. Early he is hostile to the father in whom he sees a threat to his dependent status, later the hostility is directed toward his mother in whom he sees a threat to his independence and aggressive needs. Still later it is directed toward his wife, for all too often he finds himself bur-

dened with another "mom" whose habits and ideas cause a reiteration of anxieties long dormant but still exerting their dynamic pressures in countless ways.

Man needs to be dependent to a degree at least; but when his dependence becomes excessive, we have the picture of which so many of us are aware in our neurotic patients. Complaining bitterly, unable to accept their responsibility, this attitude at times leads to a reversal of the spouses' responsibilities which we occasionally see when a neurotic illness becomes so crippling that the husband remains at home and is a semi-invalid while the wife assumes the bread-winning duties.

Let us return now for a moment to the concept of hostility. There is little opportunity for the expression of our hates in today's world. Physical violence, feuds, duels, and opportunity for physical combat have all rightfully gone with previous cultures. Failing in an outlet for his hostility man often turns it upon himself. The expression of this hostility frequently is so thwarted that his bodily processes are called upon to express feelings so strong as to be otherwise unexpressed. While it is not permissible to speak one's mind freely regarding a hated social or business competitor, society allows such phrases as "I can't stomach him" to become commonplace. Unexpressed conflicts between hostile urges and a resented need for dependency are now known to exist in the majority of our peptic ulcer patients. When we remember how frequently the functions of the lower digestive tract are called upon conversationally to express our dislike for a situation or for an event I feel that it is not asking for too much when I suggest that you consider some of the foregoing as possible clues in the etiology of functional diarrheas.

Because of the great variation seen in the cases which confront us because of psychosomatic problems no single procedure can be outlined which will apply to all. A few principles when borne in mind can be of some assistance. Since every psychosomatic illness may be looked upon as a faulty adjustment technic, and since the error must be in the individual, the environment, or both, we must be fully acquainted with the individual and the sphere in which he operates before we can plan a therapeutic approach.

One difficulty which confronts many of our male patients is an excessive degree of conscientiousness and attention to duty. Such men are quite prone to feelings of anxiety and guilt. Patients will often attribute to some superficial environmental feature, their outstanding psychologic symptom. It becomes the duty of the therapist to listen tolerantly but ever watchfully for some unsuspected conflict to arise which will more fully explain the set of symptoms. Often such explorations will take us back to the patient's remote past.

It should be mentioned in passing that anxiety is usually produced by feelings of hostility and guilt. It frequently happens that the hostility was set into motion by the patient's attitude toward a firm unyielding father in whom the patient early saw a threat to his own security and supremacy. It frequently happens that such feelings of hostility persist into adult life. Often they express themselves in other forms. A driving ambition, a relentless urge to success, a never relaxing work program are manifestations of disguised hostility which often occur in the patient with a psychosomatic disorder.

When we acquaint ourselves with the threats, misinformation, and punishment which are administered children in their formative years, it is easy to see why so much guilt and anxiety is associated with sexual trauma. Often an act which was associated with considerable infantile anxiety is forgotten but the anxiety persists, to be reactivated in later life when confronted with another stress producing situation. I believe it is safe to say that anxiety and guilt cause more unhappiness, prevent more freedom, and are responsible for more disagreeable symptoms than any other feature which confronts the physician. Unfortunately, man and physicians have been slow to recognize this. In lay prose and poetry

the concept of psychosomatic etiology has been mentioned before we gave it even a passing thought. A recent British poet, A. E. Housman expresses such an idea succintly:

"Could man be drunk forever
With liquor love or fights,
Lief should I rouse at morning
And lief lie down at night."

"But men at whiles are sober
And think by fits and starts,
And if they think, they fasten
Their hands upon their hearts."

In general, the therapeutic approach always consists in giving the patient insight. His hostility, his anxiety, his guilt must be brought to the surface. There objectively examined by patient and physician in their true perspective, the relationship between the present symptoms and early emotional experiences are brought into clear focus. Under the guidance of a wise, mature physician, the more painful aspects of probing into the unpleasant past are always tempered by reassurance, helpful planning of a daily routine, and other helpful therapeutic approaches. But such steps should not obscure the principal goal, namely the giving of insight, so that the patient can see himself and understand his anxiety and mode of life.

At this point I should like to depart for a moment and criticize one approach which physicians make in dealing with their patients. Next to the clergy, physicians are the group most often clothed with the mantle of infallibility by their patients. It is not surprising then that the physician who is lauded by his patients, praised by the press, emulated by students and junior staff members, finds it difficult to avoid a demeanor which on occasions is equalled only by the operatic prima donna. Probably one characteristic of certain physicians does more than all others to minimize his capability as a psychotherapist. I refer to the often assumed role of infallible authority. Consider for a moment a hypothetical hypertensive patient. Suffering from headaches, just rejected as noninsurable by an insurance examiner, he enters his doctor's office with anxieties, fears, and phobias of impending death or of a momentary stroke. By his first few words the physician is often able to influence the entire course of the patient's remaining years of life. He may adopt a friendly yet firm approach, letting the patient see in him a physician and friend in whom he can confide and in whom he can find a source of guidance or assistance. On the other hand, the physician may glumly adjust the blood pressure cuff, looking the patient squarely in the eye, he may remark, "Mr. Doe, are your affairs in order? From the looks of things you won't have much longer with us, you know. Of course, I might be able to help you if you do exactly as I say." The physician's orders are likely to be more crippling than the affliction itself, no cigarettes, despite the fact that the patient is a chain smoker, no alcohol despite twenty years of social drinking, no work despite a lifelong drive which was the only outlet for a vast series of hostilities and anxieties. The only prescription is complete bed rest or retirement to a country cabin. A hostile aggressive male suddenly reduced to the status of complete bed rest has naught to occupy his thoughts but ever increasing resentment. It is not surprising then that the therapy by reducing all possible outlets may be an important factor in precipitating the untimely end.

Most patients resent authority. A patient with a functional gastrointestinal complaint recently told me that he would never return to his physician for further treatment; "When he fusses at me about an occasional cigarette he sounds just like my old man getting ready to beat me." Absolute prohibitions accomplish little more than the production of an attitude like the above.

The physician needs to know himself too. Our object is to help our patient, not to control his thinking. Our aim is to relieve his symptoms, his anxieties, and not to burden him with our own prejudices, aversions, and a way of life which he cannot tolerate and does not want. Always must he guard against the expression of

his own hostilities in dealing with those seeking his help.

Impatience has no place in the physician's therapeutic efforts. Our patients will continue to manifest foibles. Advice to avoid sexual relationships to a cardiac patient will not always be followed. Tobacco and alcohol need still be utilized in helping us tolerate the problems and frustrations and anxieties of everyday life. Let us then be content in the knowledge that the vast majority of our patients will continue as always to be moderately good, moderately bad, occasionally given to excessiveness and indiscretions but we need not allow their lapses to cause feelings of rejection to arise in our hearts. Let us be ever willing to help, ever anxious to be a patient listener sufficiently detached from the patient and aware of our own emotional problems to assist the patient to maintain the Good Life.

I hope I have stimulated some interest in the patient, in his hostilities, his anxieties, his dependencies. The patient is always more important than any single organ or structure. Realizing this, it becomes apparent that the physician has a more important function than simply writing prescriptions and giving advice. He will utilize constructive reassurance, a healthy relationship that will allow the solution of anxieties as they arise, and constructive outlets for hostilities as they appear. Helping the patient achieve emotional maturity will always be the prime function of the good physician regardless of the patient's presenting symptoms. And finally let us remember that chronic, anxious thinking can at times be just as destructive as virulent organisms or malignancies. With this in mind the physician can assist the patient in plans for his daily routine, realizing that relaxation is perhaps more essential than anxiety. Our poet saw this years ago when he said:

> "Oh, tis jesting, dancing, drinking
> Spins the heavy world around
> If young hearts were not so clever,
> Oh, they would be young forever
> Think no more; 'tis only thinking
> Lays lads underground."

OBSTETRICAL REPORT OF THE SOUTHERN BAPTIST HOSPITAL FOR 1948

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NEW ORLEANS

In order to evaluate the obstetrical results in the Southern Baptist Hospital, and to obtain, by comparison with others, a true picture of the type of work being done, this analysis is presented. We hope that by presenting the overall picture of a year's work, we can get far enough away from a single case to see the results we are actually obtaining and the methods we are using. The aim of our study is that this report will stimulate us to improve our end results and to better our records. We also hope that such a report will motivate similar reports from other hospitals in New Orleans and throughout Louisiana.

The question has frequently been asked at the Southern Baptist Hospital as to whether the obstetrical service was increasing or decreasing in deliveries per year. Table 1 shows a drop of 415 patients in 1948 as compared with 1947—the first sigficant decrease in the past decade. This possibly reflects the long-expected decline in the general birth rate.

TABLE 1
SOUTHERN BAPTIST HOSPITAL,
TOTAL DELIVERIES

1939	734
1940	971
1941	1296
1942	1624
1943	2357
1944	2748
1945	2695
1946	2870
1947	2968
1948	2553

A comparison of the number of deliveries in the five largest hospitals in New Orleans is shown in Table 2.

TABLE 2
TOTAL DELIVERIES OF FIVE NEW ORLEANS HOSPITALS, 1948

Southern Baptist Hospital	2553
Charity Hospital	8113
Touro Infirmary	2168
Hotel Dieu	2217
Mercy Hospital	1160

To clarify our definition of a birth, we have used the standard of any delivery of an infant or infants, dead or alive, weighing 1000 gm. (2 pounds, 3 ounces) or more, taking place within the confines of the hospital building. Cases of twenty weeks' pregnancy or more are handled on the obstetrical service, but those infants weighing less than the above mentioned standard are not included in this report.

Comparison of private cases to service cases is as follows:

Private cases	2494	(97.7 per cent)
Service cases	59	(2.3 per cent)

The service cases (2.3 per cent) are admitted in the name of various department members and are handled under their direction by the residents. Seventy per cent of the private cases were handled by the twenty-seven members of the Department of Obstetrics and Gynecology, and the remaining 27.7 per cent were admitted to the services of 31 other physicians.

The total number of cases consisted of 1097 primiparae (43 per cent) and 1456 multiparae (57 per cent).

CESAREAN SECTION

Of the total deliveries in 1948, 188 (7.4 per cent) were cesarean sections. Table 3 shows comparative percentages with other institutions.

TABLE 3
CESAREAN SECTION RATE COMPARED WITH OTHER INSTITUTIONS

Total deliveries, Southern Baptist Hospital	2553	
Vaginal deliveries	2365	
Cesarean sections	188	(7.4%)
Charity Hospital	3.4%	
Tulane	4.3%	
L. S. U.	3.4%	
Independent	2.9%	
Touro Infirmary	10.7%	
Hotel Dieu	4.9%	
Mercy Hospital	8.3%	
Margaret Hague	3.8%	

Frequently the question has arisen as to the changing status of our rate of cesarean sections. Table 4 shows the percentage of sections at the Southern Baptist Hospital for the past decade.

TABLE 4
SOUTHERN BAPTIST HOSPITAL SECTION RATE

1939	6.8%
1940	7.6%
1941	6.2%
1942	5.0%
1943	4.5%
1944	5.9%
1945	5.0%
1946	4.7%
1947	7.7%
1948	7.4%

It will be noted that there was a decrease during the war years, possibly related to the large number of cases handled in the hospital by the Navy. However, the prewar and postwar years are closely comparable, and 1947 and 1948 show virtually no change.

The types of cesarean sections are shown in Table 5.

TABLE 5
TYPES OF CESAREAN SECTION

Total Cesarean sections	188
Classical	20
Low	152
Intra-extraperitoneal	11
Extraperitoneal	2
Porro	3

The low section represents 88.1 per cent of the total; the intra-extraperitoneal section is according to the technic of Cacciarelli.

The type of anesthesia used is indicated in Table 6.

TABLE 6
CESAREAN SECTION ANESTHESIA

Spinal	172
General	15
Local	1

Practically the only disadvantage of spinal anesthesia, as expressed by the anesthesia staff, is the fall in blood pressure which occurs in almost every case. Methods to prevent this include the beginning of a transfusion or infusion immediately after

the spinal is given. Vasopressor drugs are given either in the spinal injection just before the spinal is administered, or as soon as the blood pressure fall is noted.

Seventy per cent (131) of the sections were primary. Indications for these are shown in Table 7.

TABLE 7
INDICATIONS FOR PRIMARY CESAREAN SECTIONS

Caphalo-pelvic disproportion	70
Placenta praevia	12
Elderly primiparae (2 breech)	11
Cervical dystocia	9
Abruptio	6
Toxemia	6
Breech with disproportion	3
Cardiac	2
Face	2
Fibroids	2
Diabetes	1
Hip ankylosis	1
Hemorrhage into bladder	1
Psychosis (for sterilization)	1
Previous repair	1
Twins with compound presentation	1
Uterine inertia	1
Not specified	1

The remaining 57 (30 per cent) were done because of previous sections—the indications for the previous section still existing in some instances and not in others. Only a relatively few patients who had undergone previous abdominal delivery were allowed to deliver from below. We detect an increase in these cases, however.

VAGINAL DELIVERIES

The remaining cases were handled vaginally. There were 80 breech presentations (3.5 per cent), 2 transverse presentations, and 1 face. Note that there were 2 other face presentations among the sections, making the incidence of face presentations less than Reddoch's report.

TABLE 8
PRESENTATION IN VAGINAL DELIVERIES

Total vaginal deliveries	2365
Vertex	2282
Breech	80
Transverse	2
Face	1

The 2282 vertex presentations may be further analyzed as follows:

TABLE 9
MANNER OF DELIVERY IN VERTEX PRESENTATION

Spontaneous	1007
Low forceps	1105
Mid forceps	48
Manual rotation	26
Scanzoni's maneuver	67
Other forceps rotations	21
Version and extraction	8

The 80 breech deliveries were handled as follows:

TABLE 10
TYPES OF BREECH DELIVERIES

Extraction with forceps	18
Extraction without forceps	17
Assisted, with forceps	13
Assisted, without forceps	24
Spontaneous	8

PRENATAL COMPLICATIONS

Table 11 reveals the prenatal complications as they are described on the hospital records.

TABLE 11
PRENATAL COMPLICATIONS

Secondary anemia	262
Pre-eclampsia	36
Lues	18
Hypertension toxemia	16
Pyelitis	6
Diabetes	3
Fibroids	2
Vaginal cyst	1
Mitral stenosis	1
Acute Bartholin cyst	1
Laparotomy for ovarian cyst	1
Pathological Braxton-Hicks contractions	1
Eclampsia	1
Psychosis	1
Tuberculosis of the hip	1
Amebiasis	1

Those patients having an erythrocyte count of less than 3,500,000 were included in the tabulation on secondary anemia.

The complications encountered at labor and delivery and the operative procedures employed are shown in Table 12.

It will be noted that saddle block was used in 217 cases, or 9.2 per cent of all vaginal deliveries. No caudals were given during the year.

FETAL COMPLICATIONS

There were 16 twin births (a low incidence of 1 to 159 deliveries), making a total of 2569 babies born during 1948. Of these, 34 were stillborn, 1.3 per cent of live

births. This is a figure comparable with Touro Infirmary's 1948 incidence of 1.5 per cent and Margaret Hague's 1.7 per cent. The causes of stillbirths are shown in Table 14.

TABLE 12

COMPLICATIONS AND OPERATIONS OF LABOR AND DELIVERY

Episiotomies	1651
1° lacerations	153
2° lacerations	73
3° lacerations	9
Cervical lacerations	103
Medical induction	156
Surgical induction (including rupture of membranes)	58
Manual removal of placenta	20
Sterilization at section	18
Intrapartal hemorrhage	17
Placenta praevia	14
Abruptio	13
Prolapsed cord	7
Contraction ring	3
Ruptured uterus with hysterectomy	2
Hysterectomy for fibroid	1
Circumvallate placenta	1
Craniotomy	1
Acute pulmonary edema	1
Massive bladder hemorrhage	1
Duhrssen's incision	1

ANESTHESIA

Anesthesia was as follows:

TABLE 13

PRINCIPAL ANESTHESIA IN ALL DELIVERIES

Total cases	2553
Ethylene	1997
Saddle block	217
Spinal	172
Chloroform	109
Cyclopropane	19
Ether	14
Local and pudendal block	13
None	12

TABLE 14

ETIOLOGY OF STILLBORN DELIVERIES

Cause unknown	11
Abruptio	8
Rh sensitization	4
Pre-eclampsia and abruptio	3
Prolapsed cord	2
Hydrocephalic	2
Breech extraction	1
True knot in cord	1
Placenta praevia	1
Cord strangulation	1

When correction is made for congenital deformities incompatible with life and for cases in which no heart tones were audible after admission (mostly macerated), the corrected stillborn mortality is 25, or 1.1 per cent.

There were 25 neonatal deaths during the year, or an over-all incidence of 1.1 per cent. This is compared with Touro Infirmary's 2.4 per cent and Margaret Hague's 1.9 per cent. The causes of death are shown in Table 15.

TABLE 15

ETIOLOGY OF NEONATAL DEATHS

Prematurity	10
Congenital anomalies	4
Erythroblastosis	2
Cerebral hemorrhage in premature	2
Prolapsed cord with cerebral damage	1
Atelectasis and suppurative pancreatitis	1
Cerebral hemorrhage from Scanzoni's maneuver, version and extraction, Bandl's contraction ring	1
Cerebral hemorrhage from version and extraction for transverse presentation	1
Placenta praevia	1
Atelectasis	1
Meconium obstruction	1

When prematures below 1500 gm. (3 pounds, 5 ounces) and congenital anomalies incompatible with life are discounted, the corrected infant mortality was 17, or 0.7 per cent.

The combined stillborn and neonatal deaths were 59—an incidence of 2.3 per cent—comparable with Long Island College Hospital's 2.2 per cent and Chicago Lying In's 2.5 per cent. The total corrected deaths were 42, or 1.7 per cent.

There were 137 premature live births, using, as the standard, weight of less than 2500 gm. (5 pounds, 8 ounces). This is a premature incidence of 5.8 per cent. Thirteen prematures failed to survive, a premature death rate of 9.4 per cent. When this figure is corrected for congenital anomalies and for weight of 1500 gm. or less (3 pounds, 8 ounces), a corrected premature mortality rate of 5.1 per cent is shown.

Injuries and abnormalities of surviving babies are shown in Table 16.

TABLE 16
FETAL INJURIES AND ABNORMALITIES

Club foot	5
Facial paralysis	2
Lues	1
Absence of sternocleidomastoid muscle	1
Branchial cleft cyst	1
Mongolism with harelip	1
Umbilical hernia	1
Brachial palsy	1
Web foot	1
Hypospadias—severe	1
Fracture of left clavicle	1
Cephalhematoma	1

PUERPERIUM

Complications of the puerperium are indicated in Table 17. The international morbidity standard is used for the determination of that factor. Where no extrapelvic cause of fever was noted on the hospital record, that case was considered a corrected morbidity.

TABLE 17
COMPLICATIONS OF THE PUERPERIUM

Total morbidity	73	(2.8%)
Corrected morbidity	52	(2.0%)
Section morbidity	30	(16%)
POSTPARTAL COMPLICATIONS AND OPERATIONS		
Postpartal hemorrhage	16	
Urinary tract infection	15	
Postpartal eclampsia	2	
Postpartal sterilization	2	
Hematoma vulva	2	
Upper respiratory infection	2	
Jaundice (cause unknown)	2	
Gastroenteritis	1	
Breast abscess	1	
Episiotomy breakdown	1	
Streptococcus peritonitis	1	
Pneumonia	1	
Psychosis	1	
Eczematoid dermatitis	1	

SUMMARY

In reviewing the records of 2553 deliveries at Southern Baptist Hospital for 1948, no maternal mortalities were noted. The fetal mortality rate compares favorably with other obstetrical centers. The cesarean section rate is moderately high, while the keynote of the vaginal deliveries is conservatism.

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OBSTETRIC DEATHS RELATED TO ANESTHESIA

REPORT OF FIFTEEN CASES*

FRANK R. LOCK, M. D.

LOCKERT B. MASON, M. D.

Waters and Gillespie[1], reporting on operating room deaths in the Wisconsin General Hospital, stressed the fact that the particular anesthetic agent employed is of less importance than the care with which it is administered. Adriani[2,6] called attention to failure of the anesthetist to observe and heed prodromal signs and symptoms of impending complications. This failure may be due to faulty understanding of the action of the anesthetic agent, or to lack of experience in its administration. Too frequently the potential hazard of anesthesia is not recognized, and anesthetization is relegated to the inexperienced.

Reports of 392 maternal deaths occurring between August 1, 1946, and May 1, 1948, are in the files of the Maternal Welfare Committee of the Medical Society of the State of North Carolina. Fifteen of these deaths are attributed to anesthetic complications. These 15 deaths form the basis of this communication.

Information regarding each patient was obtained from questionnaires completed by the responsible attendant. Although the reports did not include a complete anesthetic record or postmortem examination, the

*From the Committee on Maternal Welfare of the Medical Society of the State of North Carolina and the Department of Obstetrics and Gynecology of the Bowman Gray School of Medicine of the Wake Forest College, Winston-Salem, North Carolina.

data were sufficient in most instances to establish the cause of death.

INHALATION ANESTHESIA

Five patients received the anesthetic agent by inhalation. In 4 cases ether was used. The fifth patient had nitrous oxide, ether and oxygen, supplemented by intravenous intocostrin.

Case No. 1. A 25 year old white primipara began labor spontaneously at term. Demerol was given three times during labor, scopolamine twice. During early labor fluids and small amounts of semisolid food were permitted; nothing was given by mouth after the fifteenth hour. After twenty-five hours the patient was prepared for delivery. Blood pressure, pulse, and respiration were normal. A nurse, who was accustomed to giving chloroform, administered ether by the open drop method. Induction was stormy. During the delivery the vaginal blood was quite dark, but no unusual bleeding occurred.

Very soon after delivery, atropine was given because the patient seemed "damp." While reacting from the anesthetic, she vomited large amounts of green fluid, and immediately afterward respirations became rapid and "choppy." Her face became cyanotic, and she began to cough as reflexes returned. The pulse rose to 120, although the blood pressure remained 120 systolic, 80 diastolic. Atelectasis of the right lung was noted, the foot of the bed was elevated, and oxygen was given by mask. No bronchoscopist was available. Dyspnea continued, and severe pulmonary edema developed. The patient died four and one-half hours after the delivery.

Case No. 2. A 24 year old white multipara received nembutal and scopolamine during a short, spontaneous labor at term. When the head appeared at the introitus, administration of ether by the open drop method was begun. During the second stage of anesthesia the patient vomited a large amount of liquid and solid material. Aspiration of vomitus occurred, and the patient became very cyanotic. The airway was cleared by suction, and the baby was quickly delivered in good condition. No unusual blood loss occurred. Cyanosis and tachycardia continued, in spite of oxygen, postural drainage, and digitalization. The temperature rapidly rose to 103° F. Pulmonary edema developed, and death occurred thirty-eight hours after delivery.

Case No. 3. An obese white primipara, 34 years of age, was first seen in early labor. She had been previously advised against pregnancy because of "heart trouble." On admission the patient was cyanotic and dyspneic. The cardiac rhythm was normal, the rate 80, and the blood pressure 110 systolic, 80 diastolic. Digifortis was given. The patient's condition remained unchanged throughout the long labor, during which she received 30 mg. of morphine, administered in two doses. After forty-eight hours, she was anesthetized with ether given by the open drop method. During a forceps delivery the blood became dark, and signs of shock appeared. Coramine and plasma were administered. She appeared to react favorably until an hour later, when profound shock developed and the patient expired.

Case No. 4. A 21 year old white primipara went into spontaneous labor at term. A soft systolic murmur had been present at the base of the heart for many years. At the fourth hour of labor 100 mg. of demerol, and 0.4 mg. of scopolamine were given. After six hours of labor, ether was administered by the open drop method for delivery. After 60 cc. had been given, the patient was still swallowing and moving on the table. Respiration suddenly ceased, and cyanosis appeared rapidly. The airway was open. Efforts at resuscitation failed, and the heart soon stopped. The child was not delivered.

Case No. 5. A colored woman, aged 20, had had slight vaginal bleeding for ten days during the third month of pregnancy. A diagnosis of ectopic pregnancy was made, and operation was advised. Prior to operation the blood pressure was 126 systolic, 84 diastolic, and the pulse 80. A blood count showed 11.5 gm. of hemoglobin per 100 cc. and 7,100 WBC.

Ten milligrams of morphine, and 0.4 mg. of atropine were given preoperatively. Anesthesia was induced with nitrous oxide, ether, and oxygen. Sixty units of intocostrin (curare) were given for additional relaxation. The patient's condition during anesthesia was described as poor, although the blood pressure and pulse stayed within normal limits. On opening the abdomen an amniotic sac containing a fetus 2 inches in length was found. The placenta was attached to the peritoneum of the cul-de-sac. The left tube and ovary and the products of conception were removed without difficulty and with only moderate blood loss.

The patient left the operating room in fair condition. Very soon after she returned to her room the nurses noted the presence of excess mucus in the respiratory tract. Efforts to clear the airway were unsuccessful, and the patient died.

COMMENT

Cases Nos. 1 and 2 illustrate the danger associated with vomiting during the second stage of anesthesia and during reaction from the anesthetic. Mendelson[3] has described two syndromes occurring after aspiration of stomach contents. The first is atelectasis resulting from the aspiration of solid material. The second is an asthma-like state which follows aspiration of acid

liquid vomitus. Cases Nos. 1 and 2 represent a combination of the syndromes.

The prolonged gastric emptying time of the patient in labor is too frequently overlooked. Mendelson[3] has suggested that the time of the most recent oral ingestion be recorded on the labor sheet. Gastric lavage should be done whenever it is suspected that the stomach is not empty. A transparent face mask to permit quicker observation of vomiting has been recommended.

Case No. 3 records the result of further anoxemia produced by ether anesthesia in a patient who already exhibited cyanosis, presumably due to a cardiac lesion. In case No. 4 respirations failed while the airway was adequate and before disappearance of reflexes. This occurrence represents the spasticity stage of asphyxia described by Flagg[4]. When excessive carbon dioxide is blown off during anesthesia administered by the open drop method, apnea without cyanosis may result. Failure to resuscitate the patient permits progressive anoxemia and disorientation of the vital centers.

Case No. 5 illustrates the need for prompt recognition and treatment of pulmonary complications occurring during the reactive period.

SPINAL ANESTHESIA

Among the deaths caused by spinal anesthesia, 6 were sudden and 1 resulted from a late complication.

Case No. 6. A 21 year old colored woman had a normal prenatal course and went into labor at term. Labor progressed slowly for twenty-five hours, at the end of which time pulse and blood pressure were normal. Twenty milligrams of pontocaine were injected at the third lumbar interspace. After the patient was draped for delivery, she gasped and died immediately. The time interval between introduction of the pontocaine and the patient's death was not stated.

Case No. 7. A negro woman, aged 32, had signs and symptoms of acute appendicitis in the eighth month of pregnancy. She was prepared for appendectomy, and 17 mg. of pontocaine were injected at the third lumbar interspace. Profound shock developed and the patient died within fifteen minutes after the anesthetic was given. A gangrenous appendix was found.

Case No. 8. A 24 year old colored primipara was first examined after the onset of labor at term. The blood pressure was 180 systolic, 110 diastolic, and moderate peripheral edema was present. Examination of the urine showed the presence of albumen (2 plus). Demerol and scopolamine were given twice during labor. Delivery by cesarean section was elected, because little progress had been made after eighteen hours of good uterine contractions. Fifteen milligrams of pontocaine in 2 cc. of 5 per cent dextrose were injected at the fourth lumbar interspace. Circulatory and respiratory distress appeared immediately and the patient died two minutes after the administration of the drug. Living twins were delivered by postmortem cesarean section.

Case No. 9. A white primipara, aged 20, gained 50 pounds during pregnancy. Examination forty-six hours after the onset of labor revealed moderately severe edema, a blood pressure of 140 systolic, 95 diastolic, and a pulse rate of 110. A diagnosis of cephalopelvic disproportion was made. After fifty-two hours of labor, cesarean section under spinal anesthesia was attempted. Morphine and atropine were given preoperatively, and 150 mg. of novocain diluted with 3 cc. of spinal fluid were injected between the second and third lumbar vertebrae. Respiratory and circulatory collapse occurred before the peritoneum was opened Stimulants, oxygen, and cardiac massage were ineffective. A stillborn fetus was delivered postmortem.

Case No. 10. A colored primipara, 36 years old, developed hypertension without albuminuria in the third month of pregnancy. By the eighth month her blood pressure was 190 systolic, 100 diastolic, edema was present, and the urine contained albumin (4 plus). She was treated with rest, diet, and sedatives. At terms convulsions developed, and she was referred to the hospital for cesarean section. Novocain, 150 mg., was introduced at the third lumbar interspace. Profound circulatory collapse developed rapidly, and she died before the incision was made. A living child was delivered by postmortem operation.

Case No. 11. A 21 year old white woman had had one child delivered by cesarean section because of a generally contracted pelvis. General physical examination in the ninth month of her second pregnancy was normal. Cesarean section under spinal anesthesia two days before the expected date of confinement was elected. At operation 10 mg. of pontocaine were introduced between the third and fourth lumbar vertebrae. The operation was begun, but before the uterine incision was made profound shock developed. A living child was delivered, but the patient died as the operation was being completed.

Case No. 12. A 30 year old white primipara had an uneventful prenatal course. Because of cephalopelvic disproportion, a cesarean section was done under spinal anesthesia before the onset of labor. Abdominal distention during the early postoperative period responded promptly to con-

servative therapy. On the seventh and eighth postoperative days the temperature rose to 101° F. The site of infection could not be determined and the fever subsided without specific treatment. On the eighth day the patient became depressed and noncommunicative. On the tenth day she had several convulsions. The head was drawn to the right, the neck was slightly stiff, and Kernig's sign was positive. A positive Babinski sign and ankle clonus were present on the right. The reflexes were hyperactive bilaterally. Spinal puncture showed a marked increase in pressure, which was not measured. The fluid was glazed in appearance and contained blood; the white cell count was 200 per cubic millimeter. The patient's temperature rose to 104° F. She lapsed into coma, and died after a convulsion on the twelfth postpartum day.

COMMENT

Cases Nos. 6 through 10 represent collapse following administration of the usual surgical dose of a spinal anesthetic agent for obstetric procedures. The dosage should be greatly reduced; in the pregnant woman the usual amount of the drug gives a high anesthetic level and may paralyze the muscles of respiration. Franken, as quoted by Greenhill[5], reported 1 death in 139 cesarean sections performed under spinal anesthesia, as contrasted with approximately 1 death for every 3600 operations done under spinal anesthesia in nonpregnant individuals. Care should be taken to avoid giving the drug during or immediately before a labor pain, since the contraction may force the agent to a dangerous level. No mention was made in the records of these cases concerning the anesthetic level, the blood pressure immediately after the administration, or the use of vasopressor drugs before or during the anesthesia.

Cases Nos. 8, 9, and 10 were complicated by toxemia of pregnancy. They comprise one-half the number of deaths occurring under spinal anesthesia in this series. The sudden collapse frequently induced by a spinal anesthetic in toxemic patients justifies the inclusion of toxemia as one of the contraindications to spinal anesthesia.

Case No. 12 illustrates meningitis following an intraspinal injection. Fortunately this complication is rare, but the possibility is always present. It is important to recognize the condition promptly so that treatment may be instituted early.

It is significant that there were more deaths from spinal anesthesia than from ether anesthesia in this series, especially when it is realized that ether is given much more frequently than a spinal anesthetic.

INTRAVENOUS ANESTHESIA

Two patients died after having received sodium pentothal intravenously.

Case No. 13. A 29 year old white woman who had one living child and four abortions, began to have vaginal bleeding in the fifth week of her sixth pregnancy. On the fifth day of bleeding tenderness was noted in the lower part of the abdomen. The temperature was 99° F., the hemoglobin 11 gm. per 100 cc., and the WBC 14,700. Morphine, 10 mg., and atropine, 0.4 mg., were given prior to dilatation and currettage under intravenous anesthesia. The anesthetic agent was a 2½ per cent solution sodium pentothal; the total dose was not recorded. The patient did not react promptly from the anesthesia. Six hours later tachycardia and weakening of the pulse were noted, and death occurred within a few minutes.

Case No. 14. A 29 year old multipara with chronic rheumatic mitral valvular heart disease was digitalized in the eighth month of pregnancy because of cardiac decompensation. Her blood pressure was normal and there was no albuminuria. The hemoglobin was 10 gm. per 100 cc. Cesarean section was done under intravenous sodium pentothal anesthesia, supplemented by a small amount of nitrous oxide and oxygen. During the procedure evidence of shock was present. The patient failed to react from the anesthesia, and died twenty-four hours after the operation.

COMMENT

In view of the anemia in these patients, it is probable that the reduced oxygen-carrying capacity of the blood coupled with poor respiration exchange due to a relative overdosage of the anesthetic agent, was responsible for fatal anoxia. The central respiratory depression produced by pentothal anesthesia is in proportion to the amount of the drug administered.

LOCAL ANESTHESIA

One patient died following local infiltration with procaine.

Case No. 15. A 32 year old colored woman was operated upon in the eighth month of pregnancy because of placenta praevia centralis. Physical examination and laboratory studies prior to operation was normal, and blood loss had been negligible. Preoperative medication consisted of morphine and atropine. Local infiltration with a 1 per cent solution novocain was used for anesthesia. Cesarean section proceeded smoothly without un-

usual blood loss. Eight minutes following delivery, the patient had a convulsion and died almost immediately.

COMMENT

Local anesthesia is one of the safest and most adaptable methods available for obstetrical cases at present. This case may represent the extremely rare occurrence of true hypersensitivity to procaine, although other causes of death such as air embolism cannot be excluded. Greenhill stated, "As far as I know, there has been no death of a pregnant woman delivered vaginally or by cesarean section, for which direct infiltration anesthesia with one-half per cent procaine was believed to be the cause."

SUMMARY

Fifteen maternal deaths occurring in North Carolina between August 1, 1946, and May 1, 1948, have been attributed to anesthesia. All but 1 were considered preventable and could have been averted by proper precautions.

Five fatalities occurred with ether. The danger of allowing a patient to go into the labor room with a full stomach is illustrated by two deaths which resulted from aspiration of vomitus.

Six patients died of respiratory and circulatory collapse during spinal anesthesia. In all but 1, the dosage of the anesthetic agent was larger than that ordinarily recommended for obstetrical cases. Toxemia of pregnancy was present in 3 of these cases.

In 1 patient death from meningitis occurred twelve days after a spinal anesthetic administered for cesarean section.

Two women failed to react from anesthesia with intravenous pentothal.

Death occurring in 1 case a few minutes after local infiltration of a 1 per cent solution of novocain was attributed to drug reaction, although other causes could not be excluded. This death was not considered preventable.

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HOGBEN PREGNANCY TEST

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For many years a great deal of attention has been devoted to the development or discovery of an easy and accurate pregnancy test. There have been a large number of different test animals used including mice, rats, frogs, fish, guinea pigs, and also various chemicals have been tried including prostigmin, histidine, and even human colostrum.

All pregnancy tests are based on the fact that pregnancy increases the manufacture of pituitary-like gonadotropic hormones. Therefore, these tests are really not tests of pregnancy itself, but for a certain hormone in a quantity which is usually due to normal pregnancy, but which may be present in a number of abnormal conditions associated with pregnancy, and even in some conditions without pregnancy.

Aschheim and Zondek developed the first successful test in 1928 when they observed that gonad stimulating substances appear early in the urine of human females, shortly after implantation of fertilized ovum. They used mice for their tests, which took a period of four days. Their test was 99 per cent accurate.

In 1929 Friedman modified this test, using rabbits, with an accuracy of 99 per cent. This test also took three to four days for completion. Other tests that have been used with varying degrees of accuracy include Kupperman's[1] two hour rat test, which is based on ovarian hyperemia in immature female rats after intraperitoneal injection of urine. Kupperman reported 99.5 per cent accuracy in 752 tests, but Bunde[2] was not so successful, obtaining only 90 per cent accuracy. He stated that

*From the Green Clinic, Ruston, Louisana.

the end point of the test was not sharp and there was too much tendency to report results as questionable. Guterman[3] developed the chemical test based on the pregnandiol in urine. Rickett's[4] test depended on histidine excreted in urine with 94.6 per cent accuracy. Use of prostigmin has been used with varying success—2 cc. injected daily for three days, and if the patient is not pregnant she menstruates in forty-eight hours. Mainini[5] has recently developed a [5]test using the male frog. The urine is injected into the male frog and in two hours the frog's urine is examined for spermatozoa. He reports 99.5 per cent accuracy.

In 1930, Hogben[6] observed that the ovary of the female South African clawed toad, *Xenopus laevis*, contained eggs at all times but deposited these only on stimulation by the male. He also discovered that the injection of gonadotropin caused these frogs to deposit their eggs. Since then numerous authors have reported several thousand tests with accuracy from 96 to 100 per cent. All of the inaccuracies reported have been false negatives. The frog did not lay eggs, but later the patient proved clinically to be pregnant. Most of these occurred when the test was run sooner than forty days from the last missed period. Milton[7] found that a positive result may be obtained if the excretion of gonadatropic hormone is greater than 500 I. U. in a day—a condition that rarely occurs in absence of pregnancy and usually is manifest after the first two weeks of pregnancy. Oliver and Miller[8] found that their percentage of accuracy was higher when two frogs were used for each test rather than just one. Robbins, *et al*[9] point out that in conditions such as ectopic pregnancy in which viability of the products of conception may be impaired, or when the patient may be in the process of miscarrying, the hormone titer may be so low that false negative reactions may be obtained. Weisman[10] and his co-workers checked 154 cases with frog and rabbit, and in 148 both were correct. In the other 6, the test using a rabbit was incorrect and that with a frog was correct.

Since September 1946, we have been using Xenopus in our laboratory for the pregnancy test, and, to date, have run 154 cases with 81 positive and 73 negative. All of the positive tests proved correct clinically. Of the 73 negative tests 8 later proved to be pregnant, giving 89 per cent accuracy in negative, and an overall of 95 per cent. These 8 failures are given in detail below.

CASE REPORTS

Case No. 1. White female, age 20, para O, gravida I. LMP October 3, 1946. Frog test negative November 5, 1946. Prostigmon test positive November 8, 1946. That is, after three injections of prostigmin, patient failed to menstruate. Delivered July 15, 1947.

Case No. 2. White female, age 25, para O, gravida I. History of endometriosis four years. LMP October 23, 1946. Frog negative December 13, 1946; positive December 17, 1946. First test was not morning specimen and only 40cc. of urine. Delivered August 3, 1947.

Case No. 3. White female, age 25. LMP December 10, 1946. Negative January 16, 1947. Delivered elsewhere.

Case No. 4. White female, age 28. LMP January 6, 1947. Frog negative February 11, 1947. Was evening specimen after forcing fluids. Delivered October 18, 1947.

Case No. 5. White female, age 30. Para O, gravida I. LMP January 1, 1947. Negative February 17, 1947; positive February 27, 1947. First was evening specimen. Delivered October 21, 1947.

Case No. 6. White female, age 19. Para O, gravida I. LMP March 31, 1947. Negative May 5, 1947. Delivered January 10, 1948.

Case No. 7. White female, age 20. Para O, gravida I. LMP April 14, 1948. Negative May 20, 1948. Delivered January 27, 1949.

Case No. 8. White female, age 20. Para O, gravida I. LMP October 25, 1948. Negative December 2, 1948; positive December 9, 1948.

From these reports it is evident that all the false negatives are due either to specimens being obtained before the forty day period, or being other than the first morning specimen. Only one frog was used for the test. If positive, the frog was rested one month; if negative, the frog was rested for two weeks. We have used the test to differentiate tubal pregnancy from tumors, in checking fetal viability in threatened abortions, and as follow-up for metastases from chorio-epithelioma. We have been quite pleased with the test, chiefly because of the convenience, rapidity of the test, and the objectivity of the test. There is no

question about the test—you either have eggs or you do not—and the fact that test animals may be used repeatedly. The care of the frogs is very simple. They are fed once or twice weekly and the water is changed two or three times a week. One of our frogs has been used for 31 tests and another for 22 tests.

TECHNIC

Patient is instructed to restrict fluids after the evening meal, and bring in at least 100 cc. of the first morning specimen. If the patient is unable to bring the specimen to the laboratory within an hour, refrigeration is requested. The urine is acidified to pH of 4 by the addition of 20 per cent hydrochloric acid using bromcresol green indicator. Add 5 cc. of adsormone (kaolin suspension) and agitate for eight to ten minutes. Allow to stand until kaolin settles out to about 10 cc. Supernatant clear fluid is discarded and the remainder centrifuged, and the resultant supernatant discarded, being sure to get rid of all fluid. Add 5 cc. of 0.1 sodium hydroxide to residue and emulsify thoroughly. Centrifuge until supernatant fluid is clear. Save this supernatant fluid, pour into small test tube. Add 1 drop of 0.05 per cent phenolphthalein. It should turn purple. Add 1 drop 20 per cent hydrochloric acid. Mix and color should disappear. Take 2.5 cc. of this fluid in a 5 cc. syringe, use 25 or 26 gauge needle and inject into dorsal lymph sac of rested frog. Isolate the frog in a dark place and check in twelve to eighteen hours. We usually inject in the afternoon and observe in the morning. We have had a few frogs to deposit eggs thirty-six hours after injection and these were in very early pregnancies.

CONCLUSIONS

1. The Xenopus test is an easy and accurate test for pregnancy. A false negative may be obtained if the test is run before forty days after the last period.

2. False positives do not occur. The test is entirely objective.

3. In a series of 154 cases we had 81 positive with no false positives. Seventy-three were negative and 8 false. The overall percentage of accuracy for these tests was 95 per cent.

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MATERNAL MORTALITY

A TWENTY YEAR SURVEY AT TOURO INFIRMARY

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NEW ORLEANS

This study was undertaken to determine the incidence and causes of maternal deaths in a well managed general hospital, and to note what changes have occurred in the maternal mortality rate here and elsewhere during the past twenty years.

The obstetrical patients in this series were all white, and were all delivered in the hospital. Most of them had received adequate prenatal care, but a few were sent to the hospital as emergencies, having had little or no previous supervision.

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The professional care in this group of patients was dispensed by specialists, by general surgeons, and by the residents, under the supervision of the active obstetrical staff, where public ward cases were involved.

Neither ectopic pregnancies nor abortions are included in this study, since these conditions are classified in our hospital as gynecological. Most of the deaths occurred in well advanced pregnancy, though in the earlier years of the period surveyed, three patients died of hyperemesis gravidarum during early gestation.

The period of time involved here is from

TABLE 1
MATERNAL MORTALITY AT TOURO INFIRMARY

	1929-39	1939-49	1944-49
Deliveries	8381	16,239	9673
Deaths	48	23	4
Mortality Rate	0.57%	0.14%	0.041%
Autopsies	15	12	2

TABLE 2
COMPARISON OF TOURO INFIRMARY'S MORTALITY RATE WITH OTHERS

	1929-39	1939-49	1944-49
Touro Infirmary	0.57%	0.14%	0.041%
Hospital of the Good Samaritan[1] Los Angeles, Cal.	0.29%	0.08%	
Huntington Memorial Hospital Pasadena, Cal.	0.04%	0.07%	
Winchester Hospital[3] Winchester, Mass.	0.39%	0.11%	0.072%
New Orleans[4]	1.13%	0.27%	0.152%
Louisiana[4]	0.81%	0.32%	0.218%
United States[4]	0.59%	0.26%	0.16%
Specialty hospitals report their mortality rates as follows:			
Boston Lying-In[3]	1946 & 47	0.15%	
Chicago Lying-In[5]	1931-45	0.15%	
Margaret Hague[6]	1947	0.097%	
	1948	0.103%	

TABLE 3
CAUSES OF DEATH

	1929-39	1939-49
Infection	15	4
	31.2% of all deaths	17.3% of all deaths
	1 per 558 deliveries	1 per 4059 deliveries
	0.17% of all obs. cases	0.024% of all obs. patients
	0.169% in U. S. (1937)[7]	0.073% in U. S. (1945)[7]
Toxemia	7	4
	14.5% of all deaths	17.3% of all deaths
	1 per 1197 deliveries	1 per 4059 deliveries
	0.08% of all obs. cases	0.024% of all obs. cases
	0.123% in U. S. (1937)[7]	0.051% in U. S. (1945)[7]
Hemorrhage	6	4
	12.5% of all deaths	17.3% of all deaths
	1 per 1396 deliveries	1 per 4059 deliveries
	0.071% of all obs. cases	0.024% of all obs. cases
	0.06% in U. S. (1937)[7]	0.035% in U .S. (1945)[7]
Cardiovascular-renal	8	0
Anesthesia	1 (sacral block)	5 (2 ethylene-ether 1 cyclopropane 2 ethylene)
Embolism, noninfective (all nonambulatory)	2	3
Hyperemesis gravidarum	3	0
Pyelonephritis	1	1
Pneumonia (pre- and intrapartum)	2	0
Acute Yellow Atrophy	0	1 (at 8½ months)
Diabetes	1	0
Typhoid (pre- and post-partum)	1	0
Tuberculosis, pulmonary	1 (died postcesarean at term)	0
Thrombocytopenic purpura	0	1 (terminal cesarean section)

January 1, 1929, to January 1, 1949. This span is particularly interesting since about midway in this era, the development and use of chemotherapeutic agents began, to be followed by antibiotics, blood banks, and many other important changes which have been responsible for making childbirth a much safer event.

During this twenty year period, there were 24,260 deliveries at Touro Infirmary. 71 mothers died, giving an over-all mortality rate of 0.28 per cent or 2.8 deaths per 1000 deliveries. Only one mother died who had given birth to twins.

The analysis of these deaths, considered from the standpoint of ten year periods (1929-39 and 1939-49), is given in table so that a comparison may be made.

TABLE 4
CESAREAN SECTION MATERNAL DEATHS

	1929-39	1939-49	1944-49
Deaths	10	10	2
Low cervical sections	3	9	2
Classical sections	7	1	0
Total deliveries	8381	16,239	9673
Total cesarean sections	512	1448	937
Incidence of cesarean section	6.1%	8.9%	9.6 %
Mortality rate in cesarean section	1.9%	0.69%	0.21%
Mortality rate in vaginal deliveries	0.48%	0.087%	0.02%

It is apparent that the maternal mortality rate at Touro is considerably lower for the past ten years as compared to the period 1929-39. This improvement is even more remarkable for the past five years.

Table 2 shows a comparison of maternal mortality rates with other similar hospitals, and with the city, state, and nation.

Table 3 is an analysis of the causes of maternal deaths at Touro Infirmary during the ten year periods, 1929-39 and 1939-49.

Of the 71 maternal deaths, 4 patients died undelivered, 45 patients delivered vaginally, 20 cesarean sections were done before death, and 2 were done postmortem. Table 4 describes the 20 fatal cesarean sections.

It may be seen that the maternal risk in cesarean section is considerably more than in vaginal delivery. However, it must be stated that the cause for doing a cesarean section frequently is responsible for death rather than the operation itself, and also that cesarean section done late in labor after valuable time is lost is a poor risk. (See Table 5).

The increasing incidence of cesarean section has resulted from the increased safety of surgery, and our desire to electively section a patient when disproportion is apparent, and a traumatic delivery to be avoided.

TABLE 5
CESAREAN SECTION

	Indications for cesarean section		Cause of maternal death
1929-39			
4	Failed test of labor (15-30 hrs.)	6	Sepsis
2	Eclamptic convulsions	2	Toxemia of pregnancy
1	Ruptured membrane for 3 days	1	Cardiovascular-renal
1	Cerebral hemorrhage (comatose)	1	Pulmonary tuberculosis
1	Pulmonary tuberculosis		
1	Repeat section		
1939-49			
2	Repeat section	2	Sepsis
2	Failed test of labor (1 after failure of forceps or version)	2	Hemorrhage
2	Abruptio placenta	2	Anesthesia (1 ethylene-ether 1 cyclopropane)
1	Placenta previa	1	Thrombocytopenic purpura
1	Elderly primipara (age 34 yrs.) and disproportion	3	Embolic, non-infective (all non-ambulatory) 1 air embolus on operating table 1 cerebral embolus on 1st p. p. day 1 pulmonary embolus on 3rd p. p. day
1	Thrombocytopenic purpura (terminal)		
1	Undetermined		

PREVENTABILITY OF MATERNAL DEATHS

The accurate determination of preventability in a maternal death is difficult when complete data from the attending physician are not available.

Many deaths that occurred in the earlier years of this survey had to be classified as "non-preventable" due to lack of the therapeutic facilities that we are fortunate enough to have at our disposal today.

It should be recalled, too, that the desire to avoid cesarean section and its risk ten or fifteen years ago, resulted frequently in vaginal deliveries that proved to be severely traumatic, or the performing of cesarean section late in labor, occasionally after forceps or version had failed.

Responsibility for preventable deaths does not always lie with the doctor, since the patient is occasionally guilty of self-neglect and its consequent penalty.

The hospital also must accept part of the blame for preventable deaths, where adequate preparation for meeting emergencies does not exist.

In brief, it may be stated that during the first ten year period (1929-39), 54 per cent of the maternal deaths were preventable, whereas during 1939-49, 34.5 per cent of the deaths were preventable.

COMMENTARY

It is therefore, apparent that maternal mortality has considerably decreased all over the United States during the past twenty years, and this improvement is progressive. It is thought that the following constitute the chief reasons for this advance:

1. Better prenatal care. Not only providing better care, but publicizing its availability, and urging women to take advantage of earlier supervision. Improvement in this field can still be made, and the program of public education should continue to the point where complications and deaths due to self-neglect on the part of the patient are kept to an absolute minimum.

2. The development of chemotherapeutic and antibiotic agents. Deaths from sepsis have shown the most marked decrease of all causes, and since the use of these products, surgery can be done much more safely. Nevertheless, it must be remembered that these are not "cure-alls", and their use does not constitute a reason for taking unnecessary obstetrical risks.

3. Advances in hematology. The availability and greater use of compatible whole blood have been of tremendous value in reducing deaths due to blood loss. It is quite evident, even in our small group of 71 deaths, that available blood given in time and in sufficient amount, would have saved many of these mothers. Even with the free accessibility of blood from blood banks, insufficient replacement still occurs, and this problem has been well discussed by Lund and Brumfield.[8] They report the occasional indication and life-saving value of transfusions of 3500 to 7500 cc. of blood.

4. Improvement in obstetrical instruction in medical schools and hospitals. The need for better training in this specialty has been recognized, and much finer courses of instruction have resulted. The stimulating influence of the American College of Surgeons and the American Board of Obstetrics and Gynecology has played an important part in improving the practice of obstetrics. It is becoming more and more general for hospitals to limit the staff on the maternity floor to obstetricians.

5. More informative x-ray studies. A better understanding of pelvic architecture and more complete x-ray examination have led us to fewer traumatic deliveries, and have enabled us to establish a much more reliable prognosis as to the ability or inability to safely deliver a baby per vagina. Craniotomies, embryotomies, fetal fractures, and intracranial hemorrhage were complications seen all too frequently in the past, while today they are rarities.

6. Progress in anesthesiology. Better anesthetic agents and the technic for their administration have resulted in fewer deaths from this cause. Inhalation, intravenous, and spinal anesthesia have all improved. The latter, used extensively today, was thought to be quite dangerous in obstetrical patients a few years ago. However, to obtain these good results with spinal as well as any other type of anesthesia, a well trained anesthetist is essential.

7. Closer attention to statistics and the use of the "obstetrical conference". These have served to inform us of what is taking place in the field of obstetrics, and what phase of the specialty needs our special attention. Periodic inventory is an accepted practice, and maternal welfare has been materially improved by its use.

8. Psychotherapy. Undoubtedly, emotional disturbances have an effect on the dynamics of labor, and can give rise to such complications as uterine inertia, pathological contraction ring, and so-called "cervical dystocia". Walser[9] states that "tocophobia" (fear of pregnancy) is probably responsible for most cases of motor dystocia.

The fear factor seems to be subsiding somewhat, but is still quite prevalent. It is well within the power of obstetricians to cope with this matter if sufficient time is given during the prenatal period to explain to the patient in simple terms what is taking place within her body, and what to expect from a normal pregnancy. Her questions should be encouraged and answered in such a manner that she feels completely satisfied. "To be forewarned is to to be forearmed", and proper prenatal instruction will save the patient much needless worry, and the obstetrician much valuable time. To go into labor with the utmost confidence as to a successful outcome is one of the basic principles of physiologic childbirth, as popularized by Grantly Dick Read. Prenatal classes have been an important step in the proper preparation of the patient for a successful pregnancy and labor.

These previously mentioned eight factors have been chiefly responsible for the marked and progressive lowering of the maternal mortality rate in this country. In 1933, the U. S. ranked eleventh among the leading nations in maternal mortality with 6.2 deaths per 1000 live births. In 1947, the rate was 1.3 and "we probably rank close to the lowest record of any nation".[10] This is a record of which we may truly be proud, but vigilance must continue if our improvement is to persist.

It must be borne in mind that reproduction is a normal physiological function, and certainly the loss of life, especially when it is preventable, should not be a penalty for performing this function.

SUMMARY

1. Statistics on maternal mortality at Touro Infirmary for the past twenty years are presented.

2. Statistics on maternal mortality from other sources are presented for comparison.

3. The causes of death, methods of delivery, and an analysis of cesarean section deaths are shown.

4. The preventability rate in this series of 71 maternal deaths is noted.

5. The eight important factors responsible for marked improvement in maternal mortality incidence are discussed.

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STUDIES OF THE DIETS OF PREGNANT WOMEN IN MISSISSIPPI:

I. THE INGESTION OF CLAY AND LAUNDRY STARCH

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The consumption of clay and laundry starch by a group of pregnant women studied is found to be so common and the practice so little known that the phenomenon merits a report. Because clay and starch are about equally popular constituents of the diet and neither is established on a physiological basis, we are discussing them jointly. It is hoped that this and subsequent reports will focus attention on the nutritional poverty of the group studied.

REVIEW OF LITERATURE

There is a voluminous literature on geophagy. Comparatively little has been added in recent years in America. Laufer[1] in 1930 collected the world's record of earth-eating. It has occurred sporadically for centuries in almost every section of the globe. Some of the uses of earth have been in famine to allay hunger pains, as a condiment or relish, a remedy, a part of a religious ceremony, or a delicacy devoured for its own sake. Qualities that have recommended earths are color, odor, flavor, softness, and plasticity. Usually they were fine, ferruginous clays. "Clay", "dirt" and "earth" were used synonymously in the literature, by the patients reported here and in this essay. The clay was consumed in its natural state or baked. Examples of identical earth-eating habits were found in peoples from regions so diverse that the ethnologist bowed to the physiologist, the psychologist, and the biochemist for an explanation. It appeared to have no relation to climate, race, creed, culture areas, or degree of culture. The habit was individual and not tribal. Abstainers attempted to dissuade partakers. Imitation has been a motivating factor.

Laufer further reported from several sources the cravings of the pregnant for clay, particularly in Melanesia, India, and parts of Africa. These women were, in general, inclined to clay-eating whether pregnant or not, but during gestation the custom appeared intensified. It is known that slaves brought the custom with them from Africa. Among the modern African natives geophagy is reported common.[2] Thurston[1] and Gelfand[2] remarked that the natives in both India and Africa were ashamed to let the white man know of this habit. We encountered a similar reluctance. The consumption of earth by animals is wide-spread.[3]

Dickens and Ford[4] in a well controlled questionnaire submitted to 207 Mississippi school children above the third grade, found that 25 per cent had eaten earth in a ten to sixteen day interval preceding the interrogation. Five samples taken from clay banks where people had been seen procuring dirt were analysed by soil specialists at Mississippi State College, but no conclusions could be reached. Some reasons proffered for eating clay were: "it is good for you"; "tasted good, rather sour, like a lemon"; "helps women who are pregnant". They, like us, turned up stories of mailing clay to the North, by request, to migrated relatives and of walking considerable distances to banks where clay was particularly "good".

Hertz[5] commented on clay and starch-eating among negroes in an urban community in North Carolina. She stated that it is common but provided no figures. None of the women she interviewed knew of a man who ate starch or clay. She made the observation, which may be important, that although clay and starch did not taste alike, the "feel" in the mouth was similar. The sensation was described as dry and "crumbly". The authors vouch for this description.

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BACKGROUND OF THE PATIENTS

The subjects of this study were women given antepartum care at the county health units of the Mississippi State Board of Health. Eleven counties in southern Mississippi were represented. All of these women were from the lowest economic and educational level in the area. Ninety-two per cent were negro. In 1947, 49 per cent of the population of Mississippi was colored. The average time spent in school by colored inhabitants of Mississippi is 4.7 school years.

The composition of the diet of these patients when reported by the authors will disclose a variety and quality among the poorest described in the United States. Using the admittedly high National Research Council's recommended daily allowances of specific nutrients in pregnancy as criteria for classifying the diets, 6 per cent were adequate and 94 per cent inadequate.

A preponderant number of these women were rural and the remainder had retained their rural dietary habits. The rural population totals 80 per cent of the inhabitants of the state.

Although the incidence of midwife delivery in Mississippi is 36 per cent, this group was to be attended by midwives in an incidence closer to 90 per cent. A survey of anemia in pregnancy from the same source of patients, now nearing completion, will describe unusually low average hemoglobin levels. The leading cause of maternal deaths in this state is toxemia of pregnancy. In 1947 there were 176 maternal deaths in the state. By death certificate it was established that 76 died from toxemia, 36 from hemorrhage and 14 from infection. An intensive investigation of 47 consecutive maternal deaths in south Mississippi substantiates this ratio in the causes of maternal deaths. The maternal death rate in Mississippi was 4.0 per thousand live births in 1945, 3.2 in 1946 and 2.6 in 1947. Despite this creditable decline in the death rate, the fact remains that the prospects of child bearing here are not enviable when compared to other states.

INCIDENCE

This information was turned up in the course of a detailed study in 1948 of the diets of 361 pregnant women. Trained nutritionists including one author, A. G. K., obtained diet histories of unselected patients. This was a one-day food record using the personal interview method. The patient was put at ease by a chatty conversation concerned with diet and high food costs. Confidence was soon found to be essential, as many patients were embarrassed about their clay-eating and disinclined to admit to the practice. Hence, we feel that the true incidence is higher than that quoted in this report.

The incidence of clay and starch-eating in the group studied is shown in Table I.

TABLE I
TOTAL PATIENTS STUDIED
(361)

	Starch Clay	
	Starch	Clay
Colored (331)	41% (136 patients)	27% (89 patients)
White (30)	10% (3 patients)	7% (2 patients)

Three hundred and sixty-one patients were investigated, 331 colored and 30 white. Of the colored, 27 per cent were eating clay and 41 per cent starch. In the white group 7 per cent consumed clay and 10 per cent starch. A few of these women ate starch and clay when not pregnant, but the quantity and incidence were dwarfed by the habit in the gravid state.

To obtain an idea of the habits of the general population, 270 patients were asked if their husbands ate clay or starch and none gave an affirmative answer.

The amount of starch consumed ranged from 2-3 small lumps to 3 boxes (24 oz.) per day. Several ate 1-2 boxes a day. The amount of clay was from 1 tablesponful to 1 cupful per day.

Reports from other observers and these patients have disclosed that clay and starch enjoy popularity outside of Mississippi, at least in the South, or among people recently migrated from the South.

DESCRIPTION OF THE CLAY AND STARCH

The earth consumed by these patients differed widely in appearance and source. That usually referred to as "clay" was preferred. It was fine, slimy in consistency, and contained but little sand. Red and gray clays were the favorites. It was usually eaten in the dry state. Erosion and stream banks were favorite sources. Banks exist which are a favorite in a family or a neighborhood.

The starch eaten is the Argo laundry starch. This is practically the same as the Argo cooking starch, the main difference being that the laundry starch is in the lump form and the other is a powder. Other than the starch present, the Corn Products Refining Company lists the following analysis of the product: protein, .25 per cent; ash, .10 per cent; iron, .0005 per cent; fiber, .10 per cent; acidity, .06 per cent; pH 5, No reagents are added. It is produced directly from the corn by the wet milling process and subsequent separations.

REASON FOR EATING CLAY AND STARCH

We are concerned here chiefly with the reporting of this perverted appetite and do not possess the means to adequately investigate the causality. An extended delving into physical, psychic, and ethnological factors would be needed to do justice to uncovering the incentive forces.

Laufer quoted Ehrenburg as having analysed many hundreds of specimens of edible earth without coming to a conclusion. Laufer further stated that the common explanation given by primitive peoples when pressed for one was that it was good for them. Hertz had samples of popular clay in North Carolina analysed by a geologist but no leads were furnished.

In this series of patients there seemed to be no relation between the quality of diet and the incidence of clay-eating. When the diets of clay-eaters and starch-eaters are classified as adequate and inadequate the percentage in each classification is approximately the same as in those who did not eat clay or starch. No relation is found between the incidence of starch-eating and the calorie intake.

There are suspicions cited in the literature of dirt-eating causing various maladies including anemia and tetanus.[1, 6] They seems to be based on thin evidence and lack confirmation of studies by others. We are not aware of ill effects from clay-eating in our group of women.

Numerous attempts have been made to connect geophagy and hookworm infestation.[2] Although clay-eating can cause ankylostomiasis, it is not the usual mode of infection. Ankylostomiasis as a cause of geophagy has not been convincingly demonstrated. A number of the women reported here have had stools examined with negative results. It is unusual to find hookworm in the Mississippi negro, it being one-twelfth as prevalent as in the white.[7]

Efforts by others to correlate specific dietary deficiencies and soil consumption have to date failed. A few have ascribed the eating of earthly substances to a need for salt. This seems improbable as it has been demonstrated that the clays consumed contained none or a negligible quantity and most of the eaters have had access to salt.

It is tempting to suggest a relationship between the hemoglobin levels in these patients and the ferruginous quality of the clays but we have no evidence of such an assiciation.

It is the personal impression of the authors and the nutritionists who assisted in the compiling of the data that these women eat clay, in addition to whatever other reasons there may exist, because they like the taste of it. The mores of the group from which these patients spring do not dictate strongly against this habit. Starch, being next to tasteless, we cannot fathom why it is eaten, especially by the patients with a good diet. We believe that the laundry starch is eaten instead of cooking starch because its lump form makes it easier to eat out of a box, which is the customary way that it is consumed.

Every physician knows stories of women who have acquired uncommon tastes in pregnancy and have satisfied those inclinations. The particular form reported here may be another manifestation of the curi-

ous turns the taste of a pregnant woman may take. The dirt-eating proclivities of children are known to all.

Some direct quotations from interviews with these patients are here added to help complete the picture of this remarkable practice:

"I craves it." "I know it is not good for me, but I like the taste." "Just have a taste for it." "See'd other people eat it." "I eat dirt just the same way you would smoke a cigarette." "Because it's really good." "When I get worried about by children I eat more dirt." "I crave something sour like the taste of clay." "If I don't eat dirt or starch I want to throw my food back up." "It seems to settle my stomach." 'I reckin I eat too much of it." "I know it's not good for me." "I know I shouldn't eat it." "I have to slip and eat it without letting my husband know it." "My husband won't let me eat it." "When I go up in Jasper County I get it, but can't find any good dirt here." "This Biloxi dirt ain't no good, so I gets my sister in Birmingham to send it to me." "I have to go to the country to get it and I can't go often because I can't leave the children." "Some people say it has a lot of germs so if it does I try to kill it and bake it in the oven." "Either I bake it in the oven or let it dry in the sun." "I used it with all my children." "You ought to taste that stuff (dirt). It sure is good." "I get up in the night and eat it." (starch). "Why do I crave that stuff? I want to quit it but can't." "I used to eat two boxes of starch a day. Now only a box." "My husband fusses about it." "I never heard of a man eating dirt. They not got the same taste a woman has. They not like a woman." "I lets it dry for a couple of months and keeps it in the corner in a syrup bucket by the chifferobe." "I keep it on the mantel in a box." "My mother eats it because she be's in the change and they say it will help her." (dirt). "They need starch to make bones and teeth." (statement made by midwife). "When I was a child I was coming home from Sunday School and it had rained. I could smell the dirt on the bank and started to eat it then. Have kept it up." "Sometimes I stop eating it for about a month, then the taste comes back." (dirt). "I would eat more dirt than I do, but I have a hard time getting it. I have to slip from my husband and also have to go to my mother's to find the right kind."

SUMMARY

In a dietary study of 361 rural Mississippi pregnant women, 25 per cent included clay in the diet and 39 per cent laundry starch. The patients were from an economically and medically underprivileged group and 92 per cent were negro. The literature on clay and starch-eating is reviewed. The reason clay and starch are eaten is unknown.

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MALE INFERTILITY*

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The purpose of this paper is to clarify some of the problems related to the management of male infertility and to attempt to eradicate a few of the deep-rooted misconceptions about this condition.

It is a regrettable fact that the investigation of the sterile male is frequently limited to microscopic examination under the high-dry objective of a drop of seminal fluid from a condom specimen. If the field appears to be occupied by numerous motile spermatizoa, the husband is exempted from responsibility of his barren marriage. However, if the examiner deduces that the drop is not quite up to standard, oligospermia is diagnosed. Thereafter, treatment consists of hormone injections, huge doses of vitamin E, and thyroid medication. If no improvement is evident, or pregnancy has not occurred after several months of this routine, the couple is indoctrinated with the philosophy of child adoption. Sometimes, the husband is referred to a urologist for further study.

SCIENTIFIC APPROACH TO MALE INFERTILITY

I wish to present a more logical and scientific approach to male infertility. This

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technic has been repeatedly demonstrated to be more economical in the total expenditure of time, effort, and money, and furthermore, promises a greater incidence of success.

In the initial consultation with the sterile male, a complete history and physical examination are absolutely necessary. This oft repeated recommendation merits further repetition because the key to the solution of the patient's problem is frequently overlooked when the examiner focuses his interest away from the patient in general and concentrates on the drop of seminal fluid in particular. One cannot afford to overlook the past and social histories which can contribute considerable information to the ultimate clinical impression. For example, inquiry into the assignment of a man who was a veteran of World War II revealed that he was an x-ray technician who frequently ignored basic precautions in favor of comfort and expediency. Inquiry into the sexual habits of one patient revealed that this tired business man practised coitus only once or twice monthly; all other factors being normal, the treatment was self evident. Tobacco and alcohol are known to exert depressing effects on the germinal epithelium, so that the question of excessive use of either of the substances must be established.

A thorough physical examination obviously includes a search for clinical evidence of endocrinopathies. It is equally important to appraise each body system with care. Pulmonary tuberculosis is not uncommonly responsible for depressed spermatogenic activity. One man, referred to me after many months of futile endocrine treatment for oligospermia, enjoyed a complete return to a normal sperm count four months after the surgical removal of chronically infected tonsils and no other treatment. Methodical examination of the genitalia is essential, but the limitation of the physical examination to palpation of the testicles and prostate gland is shortsighted and incomplete.

Next to be considered are laboratory data. A routine urinalysis, including examination of the centrifuged sediment, is an absolute necessity. In this connection, attention is invited to the knowledge that diabetes mellitus and nephritis are capable of being exclusively responsible for sterility. The prostatic secretion should be investigated for the presence of pus. There is no factual evidence to support the practice of utilizing the findings in the secretions of the prostate gland and seminal vesicles as an index of spermatogenic function. A serological test for syphilis is performed routinely.

We are now ready for examination of the semen. Collection of the seminal fluid is made five days after sexual abstinence. This figure is based on the results of numerous investigations which have revealed that spermatozoa reach a peak under these conditions. This is a point worth remembering in advising couples in the matter of conception when the time of the wife's ovulation has been reasonably well determined.

The time-worn custom of collecting condom specimens, later fastened with adhesive tape to the chest to keep the specimen warm, is mentioned only to be condemned. It is now known that the unwashed condom contains benzine compounds and dusting powder, both of which impair sperm motility and will even distort cell structure. Latex itself has a similar effect. It should be noted that the washed condom is not a satisfactory alternative because it does not remove all of these injurious effects; in addition to this, the remaining few drops of water are a source of error because they are not isotonic with the semen. Furthermore, motility studies are made at room temperature and not body temperature.

METHOD OF TESTING SPECIMEN

The best method is to have the patient obtain the specimen by masturbation into a scrupulously clean and dry glass container. The following laboratory tests are performed preferably within one hour following collection of the specimen:

1. *Volume*: A 10 cc. graduated pipette is used to determine the volume of seminal fluid. The normal range is between 1.5-6.0 cc. The amount of the ejaculate is important for at least two reasons. First, a

subnormal ejaculate volume will produce only a small vaginal pool and thereby reduce the possibility of intimate contact with the cervical os. Second, low pH of acidic vaginal secretions are not neutralized by the buffering agents of small ejaculates. The effects of the unaltered acidifying effects is reduction in sperm activity.

2. *Viscosity*: The viscosity can be rapidly determined by immersing the end of a wood applicator in the specimen and noting the tenacity of the fluid as the stick is withdrawn. Unusual viscid ejaculates are of significance when it is obviously responsible for slowed spermatic activity of an otherwise normal semen specimen. Inexpensive viscosimeters are available for exact studies.

3. *Motility*: Motility is checked by observing the percentage of active spermatozoa, the degree of aggressive movement (i.e., rapid or sluggish), and the duration of motility. No motility is evident in a freshly ejaculated semen specimen until liquefaction has occurred within about ten minutes. Decline in the activity of sperm does not normally commence for about three to five hours. At the end of twenty-four hours, some movement should be evident in a few spermatozoa.

In addition to this test, I have been using routinely the Weisman test which is designed to determine the ability of spermatoza to survive in an acid environment simulating the pH of the vagina. A 10 per cent lactic acid solution is buffered with 2 per cent sodium hyroxide and diluted ten times. This is added drop by drop to 0.5 cc. of the fresh semen specimen until the pH of the latter falls to 5.5 (nitrazine paper). Vigorous healthy sperm will retain their motility up to three hours under these conditions. Defective spermatozoa are rendered immotile in a much shorter time.

4. *Cell Count*: This significant determination is accurately and easily performed in about five minutes. The required equipment is a white blood cell pipette, an ordinary Neubauer counting chamber, and a couple of ounces of diluent consisting of 1 per cent phenol in a saturated solution of sodium bicarbonate. The semen is drawn up to the 0.5 mark and the remainder of the pipette is filled with the diluent. The pipette is then rapidly agitated for one minute. Then flood the counting chamber as for a blood count. Count the number of sperm in five blocks (80 squares). Add 6 zeros to the total. The final figure represents the number of sperm per cubic centimeter.

Most highly fertile men have counts over 100 million per cc. Meaker stipulates that pregnancy rarely occurs where the count is under 60,000,000 per cc.

5. *Morphology*: There are too many opportunities for error in studying only wet specimens for abnormal cell structure. The stained smear offers the only accurate means of noting sperm morphology. For routine office procedures, a simple smear, lightly fixed with heat, and stained with a Gram stain is satisfactory. Apropos of this technic,—it is not known why some sperm take Gram positive stain and others reveal a Gram negative appearance.

Hotchkiss suggests the following classification for routine morphological studies:

1. Normal or Oval
2. Tapering
3. Round
4. Duplicate
5. Giant and Pinhead
6. Amorphous

More than 10 per cent abnormal forms are thought by many workers to be conducive to infertility.

HYALURONIDASE

In 1928, a mucinolytic enzyme contained in spermatic fluid was discovered. This substance, hyaluronidase, is manufactured in the body exclusively by the germinal epithelium of the testes. It has been theoretically estimated that the amount of hyaluronidase contained in 20 million spermatozoa is essential for follicle dispersal. This may possibly explain the need for vast numbers of sperm to assure fertility. The importance of hyaluronidase in male sterility is suggested by the existence of cases of infertility in whom the sperm count, motility, and morphology are nor-

mal. The addition of hyaluronidase by direct application to the cervix has not given encouraging results as yet.

TESTICULAR BIOPSY

The testicular biopsy is a harmless and easily performed procedure which does not require hospitalization or special surgical equipment. The degree of discomfort experienced by the patient is not any worse or more incapacitating than that suffered by his wife when subjected to a Rubin test. Histological examination of the testicular substance enables the examiner to obtain an accurate estimation into the type and degree of pathology present in the germinal epithelium. It furthermore permits certain deductions relevant to the feasibility of endocrine and other types of therapy.

CONCLUSIONS OF CHARNY

Considerable guidance is obtainable from the conclusions of Charny who has performed a monumental piece of work in correlating several hundred thoroughly worked-up cases of male sterility with testicular biopsies in these patients.

1. Endocrine deficiency is responsible for less than one-fifth the cases of male sterility.

2. Endocrine therapy is ineffective in patients with subnormal semen properties if their testicular biopsy reveals end stage degenerative changes.

3. No efficient treatment has ever been found for patients who present primary testicular pathology.

4. Response to endocrine therapy has been satisfactory only in those cases in which the germinal epithelium is otherwise normal except for incomplete cellular development resulting from either faulty or inadequate hormonal stimulation.

An abundant enthusiasm has arisen in the past several years directed toward the use of vitamin mixtures, particularly A and E, in the treatment of sterility. There is no conclusive acceptable experimental proof that these vitamins are capable of stimulating spermatogenesis in healthy and well nourished human males whose germinal epithelium is either nonexistent or maldeveloped. One need only consider the marked fecundity of the undernourished natives of China and India to appreciate the questionable validity of the farfetched claims made for prescribing huge doses of tocopherols and the other vitamins. The role of the vitamins in maintaining the overall nutritional balance is not denied. But the vitamins should be regarded as contributing factors to the general well being and not possessing specific spermatogenic properties.

Thyroid therapy is considered by many clinicians to be one of the most important drugs available for the treatment of male sterility. This implicit faith in the ability of thyroid substance to produce spermatogenesis is not substantiated by experimental findings and clinical experience. For example, thyroidectomized rats suffer no interference with spermatogenesis. Hamblen and his co-workers have observed no disparity in the semen studies of men whose BMR's are plus or minus 10 when compared with men of normal BMR readings. In fact, men with much lower metabolic rates had surprisingly excellent sperm counts. It therefore seems incompatible with sound scientific fact to prescribe thyroid drugs to healthy males with no metabolic disturbances for the purpose of stimulating defective germinal epithelium.

In the past several years, testosterone has come into vogue as a means of stimulating germinal epithelium. This should be regarded as risky treatment in the face of repeated demonstrations in humans of the production of oligospermia and even azoospermia following short courses of male sex hormone therapy,

CONCLUSION

In summing up the facts pertinent to male infertility, there are a few salient points which should be the guide posts to accurate diagnosis and treatment.

1. A complete history and physical ex-

amination for the purpose of ferreting out and eliminating all extratesticular pathology which might conceivably depress spermatogenic function.

2. Realization that less than one-fifth of the cases of male sterility are caused by endocrine deficiency.

3. A healthy scepticism for many drugs, hormones, and vitamin mixtures which are already possessed in full measure by the healthy and well nourished male, and are therefore destined to prompt detoxification and elimination by the liver and kidneys.

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ELIGIBILITY FOR TREATMENT IN THE STATE CHARITY HOSPITALS

The problem of who should be eligible for treatment in the State Charity Hospitals is one which concerns the taxpayer and the physician. It was currently reported (on March 3, 1950, in the daily press) that the State Hospital Board has received complaints from doctors and Parish medical associations to the effect that charity is being granted to all applicants. It is further stated that the protests were received particularly from Lafayette, Tangipahoa, and Jackson Parish doctors. Upon receipt of such protests the Board voted to ask "the Louisiana Medical Society, the Louisiana Dental Society, the Louisiana Hospital Association and any other interested citizens or groups of citizens" to meet with it in Baton Rouge, May 3, for a final decision on the rules which will determine who is eligible to receive Charity treatment.

It was stated that the criteria under consideration by the Board, drafted for consideration and suggestions by the public and interested agencies, are as follows:

"1. Recipients of public assistance shall be considered eligible for hospital and clinic care without further certification.

"2. Any person whose annual income does not exceed the following financial scale is automatically eligible for hospital care, provided he does not have hospital insurance covering cost of illness.

"Single person—$1020.

"Couple—$1320.

"Couple with one child—$1500.

"Each additional child or dependent—$180.

"3. If any person's income exceeds the financial scale he may be declared eligible for hospital care under the following conditions:

"A) Whenever the patient shall be the wage earner of the family and the illness will result in a (total or partial) loss of income for the period of illness.

"B) Whenever the probable cost of diagnosis and extent of illness shall be so great as to be obviously beyond the person's ability to pay.

"C) Whenever a person's income does not exceed $5000 annually and he can produce reasonable evidence that he has already spent 10 per cent or more of his annual income for medical expenses.

"D) Whenever a person's income exceeds $5000 annually and he can produce reasonable evidence that he has already spent 20 per cent or more of his income for medical expenses.

"E) Whenever a member of the family shall be chronically ill and the cost of medical care would place a financial strain on the family resulting in deprivation of the necessities for other members of the family.

"F) Whenever the family has debts and financial obligations incurred prior to medical need that make payment of nominal medical costs a financial strain on the family.

4. Each case shall be considered individually and on its own merit in regard to family income, liabilities, and responsibilities."

The State Hospital Board is to be commended for taking note of the communications from Parish societies and physicians, and for calling into conference representatives vitally interested in the decisions to be

reached. This is a matter in which all should be concerned. Physicians should make themselves familiar with all the provisions in the criteria given above. In deciding this problem, all should remember that Louisiana is highest in per capita taxation and among the lowest (thirty-ninth) in per capita income. It should also be remembered that Louisiana has for years maintained a ratio of free hospital beds to population which is high in comparison with other states.

Responsible students of economics state that under free enterprise when government in direct or hidden taxes takes a total of 29 per cent of national income, the crisis is reached. At this point a depression starts unless it is deferred by inflation. The national tax bill is variously stated as being between 25 and 29 per cent of income. The Louisiana tax bill is 50 per cent above the average. It is clear then that an increase in the rate of taxation will of necessity soon initiate a depression. An increase in either the number or size of our state hospitals is not practicable since this money should not be provided by additional taxation, and would have to come from funds presently allotted to some part of luxury government.

It is the desire of the responsible taxpaying citizens of the community that the facilities of the Charity Hospitals of the State should be used only by those who cannot pay for these services. With this, organized medicine is in agreement. It is not the wish of either that they should be expanded to establish gradually state medicine. On the contrary, admission should be restricted to exclude those who can pay, and thus, make the facilities available to those who cannot. When one considers the various items in the rules of eligibility for admission, it is thought that the scale indicated in the first two items is reasonable. Reflection upon the operation of item No. 3 brings considerable doubt in the minds of those who are familiar with the operation of such hospitals as to how these various items, "A" to "F" included, could be administered. Section "A" would cover considerably more than one half of the population. Section "B" is somewhat indefinite. Sections "C" and "D" are difficult, and possibly impossible of proof and application. Sections "E" and "F" would probably not work an injustice to any, if administered in a situation in which there is complete impartiality and an adequate presentation of facts. The final item, labeled "4," is the one which would apparently give either the hospital authorities or the patient complete freedom of action.

Rules of this type, it is recognized, are difficult to formulate, and even more difficult to administer. It is to be hoped, however, that when this matter comes up for consideration that due care will be given, in order to accomplish the primary objects for which the state system of Charity Hospitals was set up, and to prevent those who can pay from crowding out those who cannot.

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ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

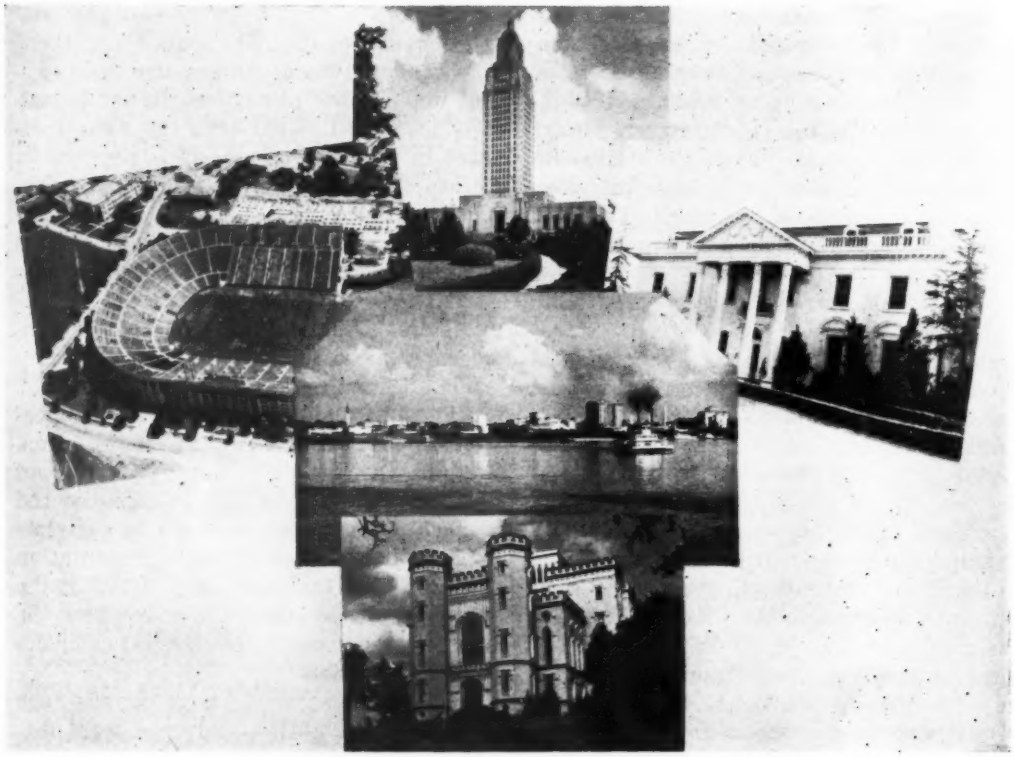
An informed profession should be a wise one.

SPECIAL NOTICE

Every effort has been made by the Chairman of the Committee on Hotels for the 1950 Annual Meeting to be held in Baton Rouge, April 24-26, to secure reservations for members making requests. Unfortunately, on Februry 10, the manager of the Heidelberg Hotel advised the Chairman, Dr. Edward G. Cailleteau, that no more rooms were available. It is hoped that confirmation of the reservations requested up to that date has been received by all applicants for rooms.

Dr. Cailleteau has advised that he will attempt to place other doctors submitting requests for reservations, in tourist courts.

A WELCOME TO BATON ROUGE



Baton Rouge, the Capitol of Louisiana, is prepared to welcome members and guests in attendance at the 1950 Annual Meeting of the Louisiana State Medical Society April 24-26. The City is accessible by plane via Delta and Eastern Air Lines, by railroad via Illinois Central System, Louisiana and Arkansas-Kansas City Southern Railway, Missouri Pacific Lines, and Texas and Pacific main line interconnection just west of the Mississippi River. In addition, four United States highways lead to Baton Rouge.

When not attending sessions of the State Society meeting, doctors and their wives may find ample diversion and recreation. There are two excellent golf courses, moving picture houses and other entertainment facilities in and around Baton Rouge. In addition there are churches representing many faiths, which members may wish to attend on Sunday preceding the meeting.

Make your plans to attend this meeting of the State Medical Society and accept a warm welcome from the City and the doctors of the East Baton Rouge Parish Medical Society.

There are several very fine courts just outside of Baton Rouge with very good accommodations, and it is hoped that the doctors will find these satisfactory. The question of room accommodations in Baton Rouge has proved a serious problem which has been handled very capably by Dr. Cailleteau and his committee. It is regrettable that all members could not be placed at the headquarters hotel, and it is hoped that the doctors will understand the difficulties encountered.

LET'S DO SOMETHING ABOUT IT

The fifth Rural Health Conference, under the sponsorship of the American Medical Association, was held in Kansas City, instead of Chicago, under the able leadership of Dr. F. S. Crockett of Lafayette, Indiana.

It was generally agreed that this was the most satisfactory of all the Conferences held to date. All groups interested in rural health were represented among the five hundred or more who attended. These included doctors, dentists, nurses, farm bureau people, the grange, the press and many other interested groups.

The program was arranged a little differently this year than in previous years. The general theme was "Let's Do Something About It", carrying out the thought that we have been making plans during the past four years for rural health and now is the time to really start giving people in rural areas better medical care.

The subject was divided into five topics, each one being introduced by a general speaker in the first morning session. These were as follows:

LET'S DO SOMETHING ABOUT IT—F. S. Crockett, M.D., Chairman Committee on Rural Health, A.M.A., Lafayette, Ind.

RURAL MEDICAL FACILITIES AT THE LOCAL LEVEL—Paul C. Johnson, Editor, The Prairie Farmer, Chicago, Ill.

RELATION OF AGRICULTURAL EXTENSION SERVICE TO RURAL HEALTH PROBLEMS — Lewis Webster Jones, Ph.D., President, University of Arkansas, Fayetteville, Arkansas.

COMMUNITY RESPONSIBILITY FOR HEALTH SERVICE IN RURAL AREAS —John Brandt, President, The National Milk Producers Federation, Minneapolis, Minnesota.

METHODS OF PREPAYMENT FOR HEALTH SERVICES IN RURAL AREAS —J. P. Sanders, M.D., Vice President, American Academy of General Practice, Shreveport, Louisiana.

THE RESPONSIBILITY OF THE MEDICAL SCHOOLS IN THE RURAL HEALTH PROGRAM—Franklin D. Murphy, M.D., Dean, University of Kansas School of Medicine, Kansas City, Kansas.

The afternoon sessions went into general study of these same subjects and were divided into two groups and certain conclusions were drawn from their discussions on Saturday morning, February 4. The section chairman brought back the results of their respective meetings.

The whole theme was carried out with the idea in mind of getting better medical care to rural people and the conclusions reached all led to one general understanding. That was as follows: Good medical care must start on the community level with all agencies interested being represented and working cooperatively. It was generally conceded that in some way the community should furnish the physical facilities for good medical care, buildings, equipment, and even local allied medical personnel would probably be best provided by the community. It was emphasized that the medical schools, the hospitals, and the medical profession in general, should stimulate more young men to enter the general practice field. It was agreed that the doctor should have a favorable environment in which to live. His wife should be happy in her surroundings and their children should have equal facilities with those in the city.

The Conference came to an end after a luncheon at noon Saturday, following a lengthy discussion on "Continuous Selling" by Dr. Kenneth McFarland, Superintendent of Schools, Topeka, Kansas. He insisted that good public relations must start in the doctor's office and with his own patients. That good health must be ever in mind in each and every person's thinking and, in general, we should never stop selling the idea of free enterprise and good medical care to the people who are interested.

The Louisiana Rural Health Committee was represented at the Conference by Dr. Guy R. Jones, Chairman, of Lockport; Dr. M. C. Wiginton of Hammond, and your reporter.

J. P. SANDERS, M.D.

LOUISIANA STATE MEDICAL SOCIETY NEWS

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

RECENT PUBLICATIONS BY DR. LEON J. MENVILLE

The second edition of Polite's book on "Clinical Radiation Therapy" has recently been published. Dr. Leon J. Menville has contributed the chapter on "Radiation Therapy in Diseases and Dysfunction of the Glands of Internal Secretion". A year or so ago, Dr. Menville contributed the chapter on the "Diagnosis of Diseases of the Small Intestine" in Pillmore's two-volume book on "Clinical Radiology" published by the U. S. Navy.

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THE AMERICAN CONGRESS OF PHYSICAL MEDICINE

Will hold its twenty-eighth annual scientific and clinical session August 28, 29, 30, 31 and September 1, 1950 inclusive, at the Hotel Statler, Boston, Massachusetts. Scientific and clinical sessions will be given on the days of August 28, 29, 30, 31 and September 1, 1950. All sessions will be open to members of the medical profession in good standing with the American Medical Association. In addition to the scientific sessions, the annual instruction seminars will be held August 28, 29, 30 and 31. These seminars will be offered in two groups. One set of ten lectures will consist of basic subjects and attendance will be limited to physicians. One set of ten lectures will be more general in character and will be open to physicians as well as to therapists, who are registered with the American Registry of Physical Therapy Technicians or the American Occupational Therapy Association. Full information may be obtained by writing to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2, Illinois.

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MEETING OF THE FOURTH DISTRICT MEDICAL SOCIETY

The Fourth District Medical Society met February 7 at the Shreveport Charity Hospital. There were 121 members and guests present.

Guest speaker was Dr. Carl Moyer, Professor of Surgery at Southwestern Medical School, Dallas, Texas, who gave a very interesting talk on fluid and electrolyte therapy.

PREDICTIONS MADE BY AUTHORITIES OF THE FEDERAL SECURITY AGENCY

Prediction by a group of scientists and health experts that a much larger quantity of ACTH, Cortisone and similar hormonal compounds would be produced this year was made public today by Federal Security Administrator Oscar R. Ewing.

The hormonal drugs, now extremely scarce, were reported last year to offer for the first time definite hope of an effective treatment for arthritis, rheumatic heart disease, certain forms of cancer and mental disease, and for certain other disease conditions.

Coupled with the prediction of greater supplies of the drugs was a strong plea that the total production be used for research purposes. It was emphasized that research involving administering the drugs to humans should be undertaken only under the most rigid medical and scientific controls, since in their present stage of development they may frequently cause undesirable or even dangerous "side effects."

This statement was given after a joint meeting held recently by the five National Advisory Councils which regularly advise the Public Health Service on the problems of general medical research.

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PRACTICAL NURSE EXAMINING BOARD ASKS SUPPORT OF HOSPITALS AND HEALTH AGENCIES

On February 25, 1950 a letter was mailed to all hospitals and health agencies giving information relative to the progress of the Louisiana State Board of Practical Nurse Examiners on licensing practical nurses, and requesting their support in carrying out the requirements of the law.

The letter stated that 3387 practical nurses had been issued licenses during the year 1949; 3207 were licensed by waiver and 180 were licensed by examination. It stated also that 3179 practical nurses had renewed their licenses for the year 1950 and are thus qualified under the law to practice as practical nurses.

Act 509, the law governing the practice of practical nurses, requires that all persons working in this capacity be licensed by the Louisiana State

Board of Practical Nurse Examiners. It requires also that all schools established be accredited by this Board.

One school in the State was qualified for full accreditation, and two have provisional accreditation. Several schools have made known the fact they are ready to apply for accreditation.

It is the desire of the Louisiana State Board of Practical Nurse Examiners to establish such regulations as will assure the public of safe and competent care by licensed practical nurses.

They would like to suggest that when you are considering individuals for employment, you ask to see their credentials and make sure they have renewed their license for the year 1950, and that you give preference to those who have completed the Extension Course whenever possible. Under the law no practical nurse is permitted to practice without a license issued by the La. State Board of Practical Nurse Examiners.

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COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION WARNS AGAINST THE INDISCRIMINATE USE OF ANTIHISTAMINIC DRUGS

Reporting on toxic reactions and even death from overdosage, the Council in its current report adds this warning in the use of antihistaminic drugs:

"With over-the-counter sale, careless and habitual use of the antihistaminics may be expected and the medical profession should anticipate similar serious reactions. Basic research is indicated on the chronic toxicity of these agents in human subjects."

The Council reviews the results reported by four groups of investigators. These reports covered 2,357 patients, more than one half being studied by a single observer. Summarizing its analysis, the Council says:

"The diagnostic methods employed have not conclusively demonstrated that the condition treated was actually the common cold. Over half of the cases were investigated in studies with inadequate controls or even without controls, and the interpretations of the results obtained are open to question."

It further says: "None of the studies established the diagnosis of a common cold beyond reasonable doubt. By exclusion of bacterial infection as a cause, one cannot arbitrarily assume that a virus is the agent responsible for the appearance of symptoms: Allergy may be involved.

"Acceptance of the patient's own diagnosis of a cold introduces many sources of error. The patient may have been mistaken in his belief that he was getting a cold; he may have been manifesting the symptoms of an allergy, or his 'cold' may have been aborted without the aid of any therapeutic agent. By physical examination alone, the cause of coryza [head cold] certainly cannot be established as the virus of the common cold.

"Thus, in none of the studies is there clearcut evidence of a verified diagnosis of the common cold."

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BLUE SHIELD MEDICAL PLANS PAST EXPERIMENT

Blue Shield plans, with an enrollment of more than 13,000,000 subscribers for medical care, have passed the experimental stage and can no longer be looked upon an an extra-curricular activity of the medical profession.

So said John F. McCormack, vice president of United Medical Service, Inc., New York, at a recent symposium in New York prepayment health plans which featured the first day of the two-day 10th annual Congress on Industrial Health. The congress, held in the Hotel Roosevelt, was sponsored jointly by the council on Industrial Health of the American Medical Association and the Medical Society of the State of New York.

Mr. McCormack pointed out that Blue Shield contemplates coverage for medical, surgical, obstetric and pediatric conditions at home, in doctors' offices and in hospitals.

"This is a comprehensive undertaking that must be developed carefully to assure permanence and stability without destroying the source of excellent medical care now available to the public," he said.

"Much thought is being given to ways and means to protect Blue Shield subscribers against the paralyzing effects of large medical bills. Everything is done to perpetuate the voluntary and confidential relationship between patient and doctor."

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BOOK REVIEWS

A Textbook of Physiology (originally by William H. Howell, By John F. Fulton. 16th ed. Philadelphia, W. B. Saunders Company, 1949. Pp. 1258. Price, $10.00.

The chief criticism of the previous edition of this textbook was that there was no discussion of the endocrine glands. This deficiency has now been remedied by an excellent section on the endocrine system written by Dr. Jane A. Russell. The entire volume has been extensively revised and there are also a number of new chapters. Drs. Nahum and Chernoff have described the newer work on unipolar electrocardiogram, the interpretation of chest leads and the general interpretation of electrocardiographic principles. There are new chapters on the gastrointestinal tract, on

muscle physiology and cerebrospinal fluid. There is also an excellent chapter on the physiology of micturition. The revision is unusually complete and all of the information has been brought up to date as of the early months of 1949. This edition is to be recommended as one of the best of the available textbooks of physiology. It still contains one of the finest discussions of the nervous system that is available in the usual textbooks. It can be recommended to the students and clinician as an excellent source of much valuable and up-to-date physiological information.

H. S. MAYERSON, Ph. D.

Care of the Surgical Patient: By Jacob Fine, M. D. Philadelphia, W. B. Saunders Co., 1949. Pp. 544. Illus.

In the preface to the book the author specifically states this is not a textbook of surgery.

"It is intended to serve the special purpose of providing a ready guide for the over-all care of the surgical patient. It epitomizes the essential facts required for an intelligent understanding of surgical disease and the basic principles involved in their diagnosis and treatment."

The author states:

"The material is presented in much the same manner as one might discuss the subject in an informal lecture or seminar to students or graduates in training."

The author has fulfilled his purpose as set forth in the preface very well.

He has proved by his writing that he is a sympathetic, conscientious surgeon and not merely an operator. His consideration for the emotional status of the patient, both in the preoperative and postoperative period is worthy of emulation by many who should read this volume. While there are points which a reviewer might not agree with, he is bound to state that the material as presented, represents careful, conscientious, observation of patients through long years of practice and the evidence of good judgment and widespread knowledge of the literature together with the ease of manner in which the author has presented his material, makes this volume one which will be of great value to the surgeon, to the resident, and to the busy practitioner, who is in search of ready references on questions involving decisions to be made.

The author has been been fortunate in having the close cooperation and collaboration of many individuals, specialists in particular fields.

This work will prove to be a valuable addition to the library of all students of surgery.

ISIDORE COHN, M. D.

Obstetric Analgesia and Anesthesia; Their Effects Upon Labor and the Child: By Franklin F. Snyder, M. D. W. B. Saunders Co., 1949. Illus. Pp. 400. Price, $6.50.

What initiates the infant's first breath of life? Through intricate animal experimentation such as hysterotomy under a saline bath, and adequately controlled tests in the human, it has been definitely established that intrauterine respiratory movements normally occur throughout a large part of fetal life. The respiratory system has been found to be of maximum susceptibility to injury during labor and accidents to this system account for the majority of stillbirths. Since obstetric analgesia presents definite hazards to mother and child, the pitfalls are pointed out in regard to newer drugs and anesthetics. In spite of the growth of knowledge of labor and of its effects upon the child, from the standpoint of mortality, escape from the uterine environment is the most dangerous experience of life—a long and hazardous eight inches of travel.

Section I, entitled "Respiratory Injuries of the Child," includes chapters on the pharmacologic factor in labor, the incidence of respiratory injury before birth, respiration before birth, intrauterine pneumonia, atelectasis, asphyxia and a laboratory method of assay of the effects of various anesthetic agents upon the mother and fetus.

Section II, "The Treatment of Pain During Labor," there are chapters on the following: analgesics and labor pain, morphine, scopolamine, barbiturate, rectal ether, magnesium sulfate and avertin, paraldehyde chloroform, narcotic gases and local anesthetics.

From the research, as well as the practical point of view, this book is filled with information useful to those interested in obstetrics and the newborn. Adherence to the principles outlined, should greatly reduce maternal morbidity and fetal deaths.

EUGENE H. COUNTISS, M. D.

PUBLICATIONS RECEIVED

Year Book Publishers, Inc., Chicago: Medical Management of Gastrointestinal Disorders, by Garnett Cheney, M. D.

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